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A. R. FOLEY, J. O. ROY and R. DESJARDINS

An Evaluation of the Modern Treatment of Syphilis

EVAN W. THOMAS

Ring Formation about Plaques of M. phlei Bacteriophage

STEPHEN I. HNATKO

Recommended Qualification Requirements and Minimum Salaries for Public Health Personnel in Canada

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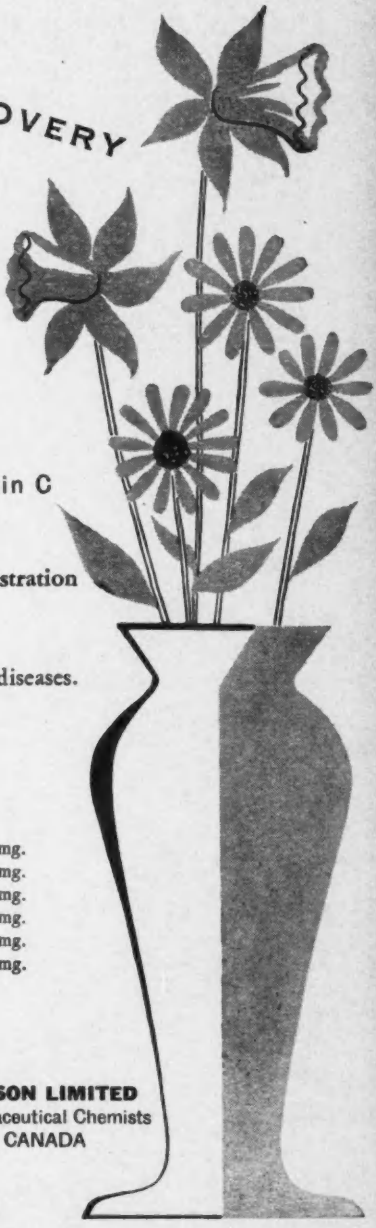

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BCG Vaccination as a Public Health Measure in the Province of Quebec

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and R. DESJARDINS,[2] M.D., D.P.H.

DURING the past few decades the Province of Quebec has made tremendous progress in alleviating the problem of tuberculosis.

In 1946, the Legislature of the Province appropriated ten million dollars for the construction of sanatoria, and the Ministry of Health assumed the cost of free hospitalization. The number of beds has been increased from 2,824 in 1940 to 5,494 in 1950, an increase of nearly 50 per cent; the mortality rate has declined from 76.3 to a provisional rate of 46, a decrease of nearly 50 per cent.

The first 35-mm. mobile x-ray unit which toured the hills and valleys of the Gaspé Peninsula is now supplemented by ten 70-mm. units which cover the whole Province. During 1950, 459,381 persons—over 10 per cent of the total population —were x-rayed by these mobile units.

One could not have hoped for the eradication of other communicable diseases as long as the armamentarium consisted only of isolation and hospitalization. When vaccination and immunization became general, smallpox was eradicated and diphtheria abated. Why not apply this logical approach to tuberculosis?

BCG vaccine has been known and tested since 1922. It is now generally accepted that it can produce a reasonable degree of protection. The Montreal group have pioneered in the preparation and use of BCG vaccine on this continent, and the Provincial Ministry of Health was the first to use BCG vaccination as a public health measure, because the need for such a specific weapon seemed more pressing in this Province.

In-Service Training of Personnel

In 1948, at the request of the Ministry of Health, the Institute of Microbiology and Hygiene of the University of Montreal agreed to take charge of the

Presented before the Epidemiology Section at the thirty-ninth annual meeting of the Canadian Public Health Association, held in Montreal May 28-31, 1951, in conjunction with the annual meeting of la Société d'hygiène et de médecine préventive de la province de Québec.

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technical part of the BCG vaccination program and the training of field personnel. The Director of the Institute, Doctor Armand Frappier, travelled with the training team all over the Province, lecturing to practising physicians and to the field personnel. He was accompanied by the authors as members of the training team.

In October, 1948, a three-day refresher course was organized by the Institute and the School of Hygiene at the University of Montreal. The course consisted of a series of lectures and demonstrations on allergy and resistance, the biology of BCG vaccine, and the results of its use. It was attended by some 75 medical officers of the Province.

The Ministry, however, did not feel that this initiation was sufficient, and it was decided that personnel, nurses and doctors, would also be trained in the field, in their own county health units. The Province was divided into twenty training zones. From 25 to 35 persons within each zone came to the training centre from neighboring health units. In this way, everyone could easily travel a short distance morning and night on training days, and be at the unit on other days to carry on the public health program.

The training of personnel began in April 1949, with a let-down during the winter, and ended in the last week of November 1950. Our medical officers of health, clinicians in tuberculosis, and public health nurses, numbering 446, were fully trained. The facilities were extended to visitors from the Department of National Health and Welfare, the Newfoundland Department of Health, and the Department of Health of Montreal.

The Technique of Training

The policy of the Ministry of Health is that each visiting nurse should carry on BCG vaccination as part of the routine work in her own district. Our aim in these demonstrations was to give every member of the health units the opportunity to see and practise every operation of the vaccination procedure.

Previous to the demonstrations, an educational campaign was conducted by the medical officers of the health units to be visited. These campaigns were made through local radio stations, newspapers, church announcements and the distribution of pamphlets. The campaigns proved to be really effective: nearly all parents wanted to have their children vaccinated.

The country and city practitioners were invited to attend lectures and discussions, either in hospitals or at meetings of the local medical societies. A large number of practitioners attended these meetings and many of them participated in the demonstrations.

The demonstrations usually lasted two weeks and were carried out in the following way:

Monday, first week: Application of the Vollmer Patch Tests, which were removed after 48 hours by the nurses of the health unit.

Friday: Reading of the reactions.

Monday of the second week: performance of the Mantoux Tests.

Wednesday: Reading of the Mantoux Tests followed by BCG vaccination. All the children negative to tuberculin tests who had a written authorization from their parents were vaccinated (practically 100%).

Two neighbouring zones were visited at a time, in order to avoid considerable loss of time on our part during the intervening days. This proved to be very effective, particularly in the districts remote from Montreal.

Before each session, appropriate lectures concerning the work to be done were given, followed by a demonstration.

For the practical work, the group was divided into teams of three or four nurses working with one medical officer. The medical staff of the Institute supervised all the teams. In this way, each nurse and medical officer had the opportunity of seeing all kinds of tuberculin reactions and could give a large number of tests and vaccinations, thus familiarizing themselves with the technique of testing and vaccination and the proper interpretation of the reactions. Furthermore, this facilitated the application of a standard technique of vaccination throughout the Province.

Selection of the Method of Vaccination

The scarification method was selected for this program of systematic vaccination. This method has proved to confer an early, high-level and persistent allergy. Furthermore, this technique of vaccination is easier and more expeditious to carry out in the hands of less experienced operators than the intradermal or multiple-puncture methods.

Description of the Scarification Method

In the newborn and infants up to two years of age, the best site for vaccination is the upper deltoid region of the external part of the arm. A total of 4 scarifications of 1 cm. in length must be performed, 2 on each arm.

For children from two years of age and for adults, negative to a strong dose of tuberculin, the low lumbar region is advised. A total of 6 scarifications is needed, 3 on each side of the spine.

BCG Skin Test

Demonstrations were also given on the use of the BCG scarification test of Frappier and Guy which reveals the state of total allergy (tuberculin and infratuberculin) and is less time-consuming, more practical, and easier to perform than serial tuberculin tests before vaccination.

A single scarification 1 cm. long is made with a sterile needle over the prepared skin of the lower lumbar region. On the other side, another scratch is performed through a drop of BCG emulsion of 20 mg. per cc. of live BCG vaccine or 50 mg. of killed BCG. The readings are made 24, 48 or 72 hours after. In practice, every subject is vaccinated who shows a reaction of 2 mm. or less at 24-48 hours after the test.

Until 1949, BCG vaccination had been left to the initiative of the medical officer of health. Now a systematic program has been established. It consists of vaccinating, by order of importance:

1. Contact newborn, within 15 days following birth, and isolating them when possible.

2. Nurses, medical students, and all persons living collectively or exposed by their profession to the possibility of infection, and who are negative to tuberculin.

3. The tuberculin-negative subjects living in contact with known tuberculosis, or members of families where children have been found tuberculin-positive at school.

4. Routinely the newborn, either in the nurseries or at home, within 15 days following birth. This procedure eliminates the necessity of tuberculin testing.

5. Mainly school children of the first and last year of the academic course; that is, children 7 years old and 14 to 18 years old who have been found tuberculin-negative. All school children are first tuberculin-tested (Vollmer and Mantoux) in order to detect the infected families and to refer their members to the tuberculosis clinics. The BCG scarification test is now more and more used instead of the tuberculin serial tests. All positive individuals, children and adults, are x-rayed and followed up.

By the end of 1950, all the public health personnel of the Ministry of Health had been trained. During the demonstrations, roughly 12,765 school children were tested and 9,500 vaccinated, with an average of 675 tests and 500 vaccinations at each demonstration. Some 40,000 vaccinations in 1949 and 65,862 in 1950 were performed in the Province of Quebec.

Since the beginning of BCG vaccination in 1926, the Institute has kept records of all vaccinations in the Province. In 1949, because of the increasing number of vaccinations, the Institute had to devise a better method of collecting and sorting these statistics. Now the Central Registry of BCG, located at the Institute, is in a position to meet its three-fold purpose: to give the public and institutions all information required, to keep the statistical records, and to ensure the follow-up of all vaccinated persons.

An Evaluation of the Modern Treatment of Syphilis

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THE modern treatment of syphilis has numerous advantages over the older types of therapy. Not only is the *Treponema pallidum* more easily destroyed by penicillin than by any previously used antisyphilitic agent, but also treatment with penicillin can be completed rapidly with unusual safety to the patient. From a public health standpoint the need for rapid treatment of syphilis has long been recognized. With the older forms of prolonged therapy the task of controlling syphilis and preventing frequent late complications was almost impossible in a great continent like America because of the difficulty in case holding.

Prior to the advent of rapid therapy, it was estimated that less than 25 per cent of clinic patients in the United States of America received regular treatment following a diagnosis of early syphilis. As a result, in spite of early diagnosis, numerous individuals subsequently became public charges because of irreparable damage to important tissues. The cost to the public of such treatment failures was great. At Bellevue Hospital in New York well over 50 per cent of the patients treated for active neurosyphilis with fever therapy or penicillin had received previous metal therapy at sporadic intervals, oftentimes for years. Even after the infection had been arrested by fever therapy or penicillin, some of these individuals had to be institutionalized. The advent of penicillin promises to change this picture, provided the ultimate results are as good as anticipated.

All types of late syphilis are now being treated within a period of two or three weeks, and, for experimental purposes, the treatment of early syphilis is being completed in a single clinic session at a number of cooperating clinics in the United States of America. The latter form of minimal therapy is not recommended as a routine procedure but, so far, the results with 2,400,000 units of procaine penicillin in oil and aluminum monostearate have been surprisingly good. Therefore, the problem of case holding during treatment has been fairly well solved by penicillin. The question that remains to be answered is whether or not penicillin is actually curing syphilis in as high a percentage of cases as many

Presented before the Venereal Disease Control Section at the thirty-ninth annual meeting of the Canadian Public Health Association, held in Montreal, May 28-31, 1951, in conjunction with the annual meeting of la Société d'hygiène et de médecine préventive de la province de Québec.

of us are led to believe. Skepticism about this point still exists. Therefore, in this address, rather than review the statistics on follow-up observations of penicillin-treated patients, I plan to evaluate the modern therapy of syphilis from the point of view of its ultimate effects.

My purpose is not to discuss penicillin in terms of a panacea for every case of syphilis. No such panacea exists and most physicians are too well trained and experienced to think in terms of panaceas, especially in so complex a disease as syphilis. The question to be determined is whether or not rapid treatment of syphilis is actually preventing future manifestations of the infection more effectively than the older methods of prolonged therapy. In view of the much shorter experience with rapid treatment than with prolonged therapy, we cannot answer this question by comparative observations over a period of 20 or 30 years and it is well known that signs and symptoms of late syphilis may not become apparent for more than 20 years after infection. Therefore, we must evaluate the probable ultimate effects of rapid therapy by analyzing the available data in the light of past experience. To do this is not a simple task, partly because of the complexity of the disease and even more because of our ignorance of the life history of the *T. pallidum* and of the exact interpretation of positive serologic tests for syphilis. In the remarks which follow, conclusions regarding the ultimate results of modern therapy are founded on the most reasonable probabilities rather than on absolute proof.

Problem of Differentiating Between Active and Inactive Syphilis

The first problem to be solved in the management of any chronic disease is to determine the activity of the pathologic process. A positive tuberculin test does not prove active tuberculosis, nor does the presence of murmurs in rheumatic heart disease prove active rheumatic carditis. Fortunately, we have numerous ways of distinguishing between activity and inactivity in these conditions. In many cases of syphilis, however, our present means of differentiating between an active and inactive infection are totally inadequate. In so-called latent syphilis our only means of making the diagnosis is by serologic tests and in late syphilis the serologic tests for syphilis afford scant information about the activity of the presumed infection. As a rule, demonstrable reagin does not disappear from the blood serum in late cases of syphilis for many years after treatment and even with the aid of quantitative tests it is frequently impossible to determine the effects of treatment by relying solely on such tests. But, in spite of their inadequacy, we are dependent on serologic tests for syphilis to a great extent in the management of a syphilitic infection and much can be learned from them, especially after treatment of early syphilis.

In the treatment of early syphilis the great desideratum is to obtain and maintain seronegativity. This desired result has been achieved by penicillin in a relatively high percentage of treated patients who have been followed up for periods of from two to seven years. Does this mean that the infection has been permanently arrested in these patients? To attempt to answer this question requires evidence, first, that seronegativity is reasonable proof of an inactive

infection and, second, that negative tests will not subsequently become positive years later in the absence of reinfection. No evidence exists that either of these points is true in 100 per cent of cases but I hope to show that, as a rule, they are true and that the exceptions to the rule are not likely to impose an important public health problem. Let us, therefore, first examine the relationship of active syphilis to seronegativity.

Relationship of Active Syphilis to Seronegativity

After the seronegative stage of primary syphilis, the serologic tests for syphilis are practically always positive in early syphilis. At Bellevue Hospital we have not observed a completely seronegative case of secondary syphilis during the past fifteen years. In late syphilis, however, an active infection may, on occasion, be associated with seronegativity. About 2 per cent of patients with active tabes dorsalis, as proved by spinal fluid examinations at Bellevue Hospital, have had negative blood tests for syphilis. In other types of active neurosyphilis, seronegativity has been exceedingly rare. Occasional seronegative cases of cardiovascular syphilis have been noted, but in such cases it is difficult, if not impossible, to determine the actual activity of the infection. Gummas are usually associated with large amounts of reagin in the blood serum and seronegative cases of gummas are so rare as to be negligible. Therefore, seronegativity of several months' duration is rarely associated with active syphilis. The chief exception to this rule is a small percentage of tabetics in whom the diagnosis of neurosyphilis could have been made at any time four or more years after infection by spinal fluid examination. It can also be stated that we have little evidence that inactive syphilis which has become seronegative relapses to activity unless the serologic tests for syphilis become positive. Therefore, we have little reason to fear the development of syphilitic lesions in patients who have become seronegative following treatment of syphilis unless the blood tests revert to positivity.

This conclusion leads us to the second point to be examined. What are the possibilities that patients who become seronegative following antisyphilitic treatment will relapse to seropositivity in the absence of reinfection? We know that this event has occurred frequently during the first two years after rapid treatment of early syphilis but in this discussion, so far as early syphilis is concerned, we need to know the possibility of relapse more than two years after treatment.

Relapse and Reinfection After Treatment of Syphilis

Before discussing relapse it is necessary to keep clearly in mind the meaning of this term. Manifestations of late syphilis appearing years after treatment of early syphilis do not represent a relapse. The term relapse can be used only in cases where the syphilitic infection is known to have been inactivated by treatment and has subsequently become active. Following treatment of early syphilis, inactivity is demonstrated by prompt healing of lesions and a marked reduction in the reagin content of the blood serum. Relapse is diagnosed by marked

increases of reagin and usually by the reappearance of darkfield positive lesions. Early syphilis does not relapse with late lesions. However, once a patient has passed through the early acute stage of syphilis and entered the chronic state, the body tissues, with very rare exceptions, will never again react to treponemes with early lesions, even though the late syphilis is cured by treatment and reinfection occurs. Relapse or reinfection following treatment of late syphilis is usually demonstrated by marked increases in reagin or by the reappearance of late inflammatory or degenerative lesions. Both relapse and reinfection are much less frequently noted after treatment of late syphilis than of early syphilis. To differentiate accurately between relapse and reinfection is frequently impossible. Following treatment of early syphilis the only absolute proof of reinfection is a new chancre which appears at a different site from the original one. Unquestionably, however, reinfection may occur without an observed chancre. Because of this fact, statistics based on re-treatments after rapid therapy of early syphilis are vitiated by an unknown number of reinfections.

At Bellevue Hospital we started rapid treatment of early syphilis with arsenoxide alone or arsenoxide and fever therapy in December, 1939. If these patients are included with those given penicillin, we had treated over 7,000 patients for early syphilis by 1949. At least 60 per cent of the patients were followed up for two years after treatment and in 1951 we still have under observation over 1,000 patients who have been followed up for five to eleven years. The number of re-treatments necessitated by relapse or reinfection varied with the adequacy of the various treatment schedules used and with the prevalence of infectious syphilis. By 1949 we had re-treated over 1,000 patients who had originally received rapid treatment of early syphilis. A review of these re-treatments showed that 75 per cent occurred within the first year after therapy and 90 per cent within the first two years after treatment. Study of the histories of patients who had to be re-treated more than two years after treatment led my associate, Landy, and me to conclude that practically all were reinfections. Almost one third of these patients had new chancres and many of the remainder gave histories of contacts with early syphilis. For similar reasons we also concluded that possibly 50 per cent of the re-treatments during the first two years after treatment were probable reinfections. In our judgment practically all of the probable relapses occurred within the first eighteen months after treatment.

During the early years of rapid treatment it was generally believed that reinfections following treatment of early syphilis were exceedingly rare. Today, however, no experienced worker in the field doubts that reinfections have frequently occurred. That the old concepts about the rarity of reinfection following treatment of early syphilis were based more on preconceived ideas than on fact is shown in a recent report by Landy and me. In our Bellevue records we found 311 patients who were given rapid treatment for darkfield positive syphilis because of relapse or reinfection at varying intervals after prolonged metal therapy. We concluded that 215 of the 311 were actually reinfected; 98 had new chancres and the remaining 107 had become seronegative for varying periods up to more than twenty years after their original prolonged

treatment. The reinfections occurred from one to twenty-eight years after metal therapy; 172 took place more than two years after treatment and it requires a great stretch of the imagination to diagnose such cases as relapses.

The surprising fact, of course, is that we have not observed *more* reinfections more than two years after treatment of early syphilis. Apparently many individuals develop sufficient immunity during the early stage of the disease prior to treatment to prevent reinfection by a few treponemes; others fail to develop such immunity. In the latter category it is not surprising that patients are more likely to become reinfected within the first year or two after treatment because they frequently are exposed to individuals whom they had infected before their treatment or they are so promiscuous in circles where early syphilis exists that they soon become reinfected.

Regardless of the reason for the failure to see more late reinfections after treatment of early syphilis, we know that almost 90 per cent of the cases of either relapse or reinfection have occurred within the first two years after treatment. As proved by new chancres, reinfection has occurred at any time after treatment of early syphilis—even thirty years later—but no such proof exists for relapse. Negative as this evidence may be, it favors the belief that the relatively small percentage of re-treatments necessitated more than two years after rapid treatment of early syphilis is due to reinfection rather than to relapse.

Turning now to late syphilis, as previously mentioned, cases of probable relapse or reinfection are much less frequently suspected following treatment of late than of early syphilis. With the exception of neurosyphilis, it is extremely difficult to diagnose relapse or reinfection after treatment of late syphilis unless the blood tests have become negative and some months or years later revert back to strongly positive. This event has unquestionably occurred in some cases but it has been noted infrequently because the blood tests, as a rule, do not become negative for many years after treatment of late syphilis. In late neurosyphilis, as we will have occasion to see later, relapses rarely, if ever, have occurred more than two years after treatment has reduced the infection to inactivity.

In summary, therefore, thus far, we have seen that active syphilis, with the exception of tabes dorsalis, is rarely associated with negative serologic tests for syphilis, that syphilis rarely progresses unless the blood tests are positive and that relapse of syphilis rarely, if ever, occurs more than two years after treatment. We now need to know what the spinal fluid examinations have shown in patients given rapid treatment for early syphilis and also for late neurosyphilis.

Spinal Fluid Findings in Patients Followed up After Treatment of Early Syphilis

As previously stated, at Bellevue Hospital we have over 1,000 patients still under observation from five to eleven years after rapid treatment of early syphilis. In addition to this group we have followed up several thousand for at least two years after treatment. Spinal fluid examinations have been done from one to two years after treatment on most of these patients. We have yet to find positive

spinal fluid findings for syphilis in a single patient whose blood had become and remained seronegative following treatment of early syphilis.

As is well known, from 15 to 30 per cent of patients treated for secondary syphilis fail to become completely seronegative for more than one year after treatment. Provided these patients within one year after treatment had rapid drops in reagin titers to relatively low levels, i.e., positive tests in dilutions of 1 to 2 or less, we have found little reason to re-treat them. With rare exceptions, unless reinfection occurred, these individuals finally became seronegative without re-treatment, although in 3 or 4 cases it required more than five years after treatment for the tests to become completely negative. Spinal fluid examinations have been done at yearly intervals on most of these patients. Positive findings for active neurosyphilis were found in the spinal fluid of 2 of these slightly seropositive patients more than one year after treatment, but in patients who had become seronegative and remained seronegative the spinal fluid findings have always been normal.

Partly because of this fact, we have been less insistent about getting spinal fluid examinations on seronegative patients more than two years after treatment, but when I last reviewed records I found 572 seronegative patients who had had spinal fluid examinations more than four years after rapid treatment of early syphilis. All were normal and it is well accepted that neurosyphilis does not develop in patients who have had normal spinal fluid examinations four or more years after infection. It appears, therefore, that the rapid treatment of early syphilis has prevented neurosyphilis in all cases where the blood tests for syphilis have become and remained negative.

We now need to know what rapid treatment with penicillin has accomplished in late syphilis. As previously noted, the blood tests for syphilis are of less help in evaluating the treatment of late than of early syphilis. Fortunately, however, in late neurosyphilis spinal fluid tests are available which reflect the activity of the infection with reasonable accuracy. The presence of increased cells in association with positive specific tests for syphilis of the spinal fluid represents an active process, as does increased total protein. Following treatment, inactivity is shown by normal cell counts and by gradual falls in the quantitative specific tests for syphilis and by more rapid declines in elevated protein determinations. Failure to inactivate the infection is reflected by continued pleocytosis. Relapse is demonstrated by the re-appearance of pleocytosis and rises in other quantitative tests of the spinal fluid after treatment has temporarily inactivated the syphilitic process.

Dattner, who assisted Wagner-Jauregg at the onset of malaria therapy for general paresis in Vienna, was the first observer to recognize the importance of spinal fluid cell counts in differentiating between activity and inactivity of neurosyphilis. He has been associated with me in New York since 1938 and he has probably had a greater experience with spinal fluid examinations in evaluating the effects of therapy of neurosyphilis than any other worker in the field. In his experience and also in my less extensive experience, active neurosyphilis, as demonstrated by spinal fluid findings, does not relapse more

than two years after treatment has produced inactivity. Neither of us has seen such a relapse, although relapses have frequently been observed within the first eighteen months after treatment.

We now have a large amount of data in the United States of America indicating that treatment with from 6 to 10 million units of penicillin, given over a period of ten to eighteen days, has arrested all types of active neurosyphilis for more than two years in at least 90 per cent of cases and a higher percentage when re-treatments are taken into consideration. This statement is based on spinal fluid examinations and not on clinical findings. Arrest or even cure of a syphilitic process in the central nervous system does not guarantee clinical improvement or the restoration of functions which have been lost because of irreparable damage. Amblyopia due to syphilitic primary optic atrophy cannot be cured by killing treponemes and failures to restore normal mental capacity to deteriorated paretics by penicillin therapy does not reflect on the therapy unless the spinal fluid findings show continued activity of the infection. On the basis of spinal fluid findings penicillin seems superior to fever therapy for all types of neurosyphilis. In view of this conclusion, equal amounts of penicillin should be adequate treatment for most patients with other types of late syphilis.

Schedules of Penicillin Therapy

In the foregoing discussion nothing was said about the relative merits of different penicillin schedules of treatment. Data on this subject are readily available in the literature. I can tell you, however, that at the Syphilis Study Section Symposium, held in April of this year in Washington, D.C., the consensus seemed to favor a total dosage of not more than 4,800,000 units of procaine penicillin in oil and aluminum monostearate (PAM) for secondary syphilis. Individual injections of 1,200,000 units at intervals of two or three days were advised. For primary syphilis, a single treatment with 2,400,000 units of PAM was reported as very effective. For late latent syphilis from 4 to 6 million units of PAM were regarded as adequate routine treatment and for neurosyphilis and symptomatic late syphilis from 6 to 9 million units. Individual injections of 600,000 units can be given daily or injections of 1,200,000 units can be given two or three times a week. For relapses larger doses of penicillin are advisable.

I can say very little about aureomycin, terramycin, and chloramphenical in the treatment of syphilis because I have had little experience with these antibiotics and I am skeptical of oral treatment of syphilis for clinic patients. We cannot afford to encourage drug-store practice of syphilis, and even under the direction of a physician it is impossible to be sure that relatively ignorant and oftentimes irresponsible patients will take the medication as ordered. Furthermore, aureomycin in the advised doses of 4 gm. a day for ten to twelve days oftentimes produces gastrointestinal complaints. However, good results with aureomycin treatment of neurosyphilis have been reported from the Mayo clinic and it is certainly advisable to have as many weapons as possible in our antisyphilitic armamentarium.

Concentric Ring Formation about Plaques of *M. phlei* Bacteriophage

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BACTERIOPHAGES active on acid-fast microorganisms have been reported within recent years by several authors.[1, 2, 3] Briefly, such phages were isolated from soil, usually by a process of enrichment of a soil sample with a particular acid-fast microorganism. To date, phages active on *M. smegmatis, M. phlei, M. paratuberculosis* (Fribergensis, Rabinowitsch, and Pellegrino) have been isolated. These have been designated by the name of the particular microorganism upon which the phage is active (e.g. *M. phlei* phage, *M. smegmatis* phage). The fact that phages for the mycobacteria were not previously reported may indicate that they are limited in their distribution.

In the course of recent work in these laboratories, *M. phlei* phages were encountered which produced concentric rings of different degrees of lysis surrounding a plaque. The phenomenon of ring formation in relation to phage, briefly described in this paper, has not to our knowledge been previously reported.

Methods

Isolation and Properties of Phages

The phages giving rise to ring formation were isolated from soil following an enrichment technique. The method of isolation was a modification of that of Gardner and Weiser[1]. Briefly, the enrichment was carried out on 50-gm samples of hot-bed soil treated semi-weekly with 7 ml of five-day broth cultures of (1) *M. phlei* (Ph_1) and (2) *M. phlei* and *M. smegmatis* (Ph_1+S_1) which had been centrifuged, washed and suspended in saline. Two samples of soil were used for each test. Incubation was carried out at 37°C. for four weeks, after which 30 ml of sterile distilled water was added to each soil sample. Upon settling of the soil, the supernatant fluids were passed through a Seitz-EK filter and tested on homolgous and heterologous strains for phage activity. Testing consisted of placing several drops of the Seitzed phage-containing filtrate with a Wright's pipette on an agar plate inoculated previously with the micro-organism.

The liquid medium used was nutrient broth of the following composition: 10 gm Bacto-peptone, 5 gm NaCl, 5 gm Bacto meat extract, and 1,000 ml of distilled water; pH 7.4. Two per cent agar was added to make the solid medium for testing the activity of the phage.

The two soil samples inoculated with (Ph_1+S_1) yielded a filtrate which produced lysis of culture Ph_1 and ATC607. This latter strain, obtained from

the American Type Collection, is listed in the catalogue as an avirulent strain of *M. tuberculosis* which grows rapidly on simple media. The strain according to phage pattern seems to be more closely related to *M. smegmatis* than to *M. tuberculosis.* Likewise one soil sample inoculated with Ph_1 yielded a filtrate active on Ph_1 and 607, whereas the second soil sample yielded a lytic agent originally active on Ph_1, 607, and two *M. smegmatis* strains, S_1 and S_2. This phage, after four passages of the filtrate with 607, lost its activity for the two *M. smegmatis* strains. The *M. phlei* phages isolated, and referred to above, were designated MT_{2a}, MT_2, and MT_3. Control filtrates of uninoculated soil yielded no lytic agent.

Phage MT_2 gave confluent lysis on solid medium in a dilution of 10^{-5} with 607 and Ph_1, MT_3 in a dilution of 10^{-6}, and MT_{2a} in a dilution of 10^{-4}. Originally, the MT_3 filtrate gave confluent lysis in a dilution of 10^{-4} with 607, Ph_1, and 10^{-2} with the two *M. smegmatis* strains. The activity of phages MT_{2a} and MT_2 was destroyed by heating at 78°C. for ten minutes, and greatly reduced by heating at 75°C. for ten minutes. Phage MT_3 was not totally inactivated at 78°C. for ten minutes.

Assay of Phages

As the solid medium for plating both bacteria and phage, nutrient broth of the composition described previously was used with a final concentration of 1% agar. For the production of plaques by the pour plate method, successive tenfold dilutions of the phage suspension were made in sterile nutrient broth. 0.1 ml of appropriate phage dilution was mixed with 1 ml of a 48-hour culture of host bacterium, 607, and 10 ml of 1% melted nutrient agar, cooled to 45°C., was added to the mixture and poured into a sterile petri dish. Usually dilutions of 10^{-5} to 10^{-7} of the phage suspension were used for the assay. Clear, round plaques appeared in about 18 hours at 37°C. and were about 3 mm in diameter (Fig. 1(a)).

MT_2, MT_{2a}, MT_3 Phages and Ring Formation

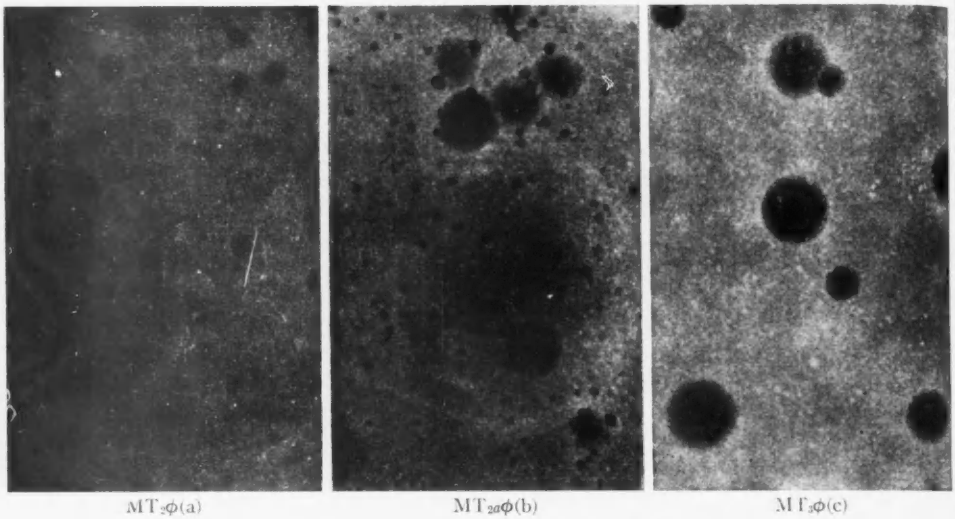
Plaques

Phages MT_2 and MT_{2a} were found each to produce two types of plaques, a large halo plaque and a small haloless plaque. Isolation of the plaques and propagation with susceptible strain revealed that each produced its characteristic plaque type. Infection of the host cells, 607 or Ph_1, with a large and a small plaque phage produced both types of plaques (Fig. 1(b)). Phage MT_3 produced two types of halo plaques, i.e., a large plaque surrounded by an almost complete zone of lysis and a small plaque with a partial zone of lysis (Fig. 1 (c)). Interference between contiguous plaques can be observed. This interference occurs only when two plaques meet, otherwise the formation is normal (Fig. 2(f)). No interference was observed between similar plaques.

With an increased agar concentration, a marked decrease in the plaque count, as well as the size of the plaque, was observed.

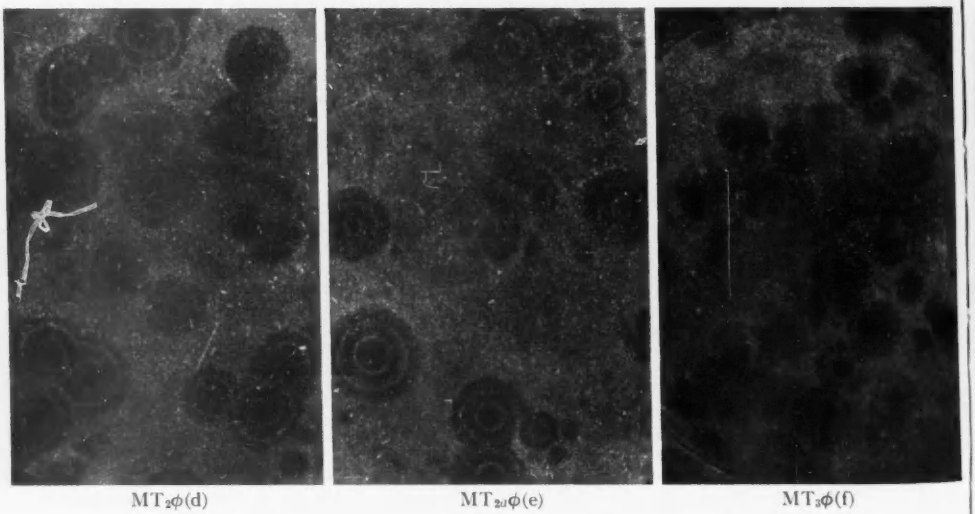
Rings

The rings in question are the lysed areas around the plaques. After the appearance of plaques, clear rings were obtained by holding the plates at



$MT_2\phi$(a) $MT_{2a}\phi$(b) $MT_3\phi$(c)

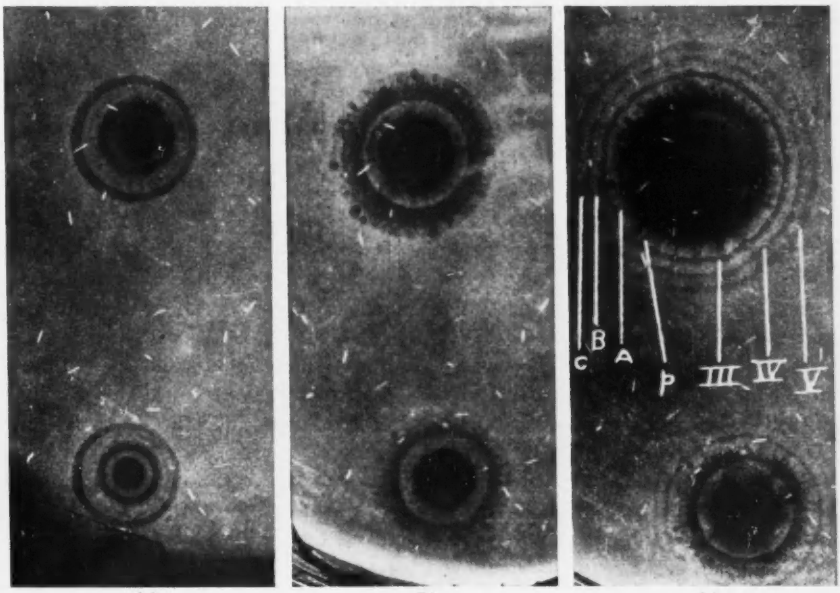
FIG. 1. Plaque Formation of *M. phlei* Phages.
(a) 18 hours' incubation at 37°C.
(b) Small and large plaques of phage MT_{2a}.
(c) 48 hours' incubation of phage MT_3 and Ph_1.



$MT_2\phi$(d) $MT_{2a}\phi$(e) $MT_3\phi$(f)

FIG. 2. Concentric Ring Formation of *M. phlei* Phages.
MT_3 illustrates interference effect between contiguous plaques (4/5 normal size).

refrigeration, 6°C., followed by subsequent standing at higher temperature. A succession of concentric rings will develop upon repetition of the procedure, i.e., alternate refrigeration and incubation or vice versa. Thus with each cycle of refrigeration and incubation a ring is produced (Fig. 3(a,b,c)). As many as sixteen rings surrounding one plaque have been obtained. Rings of greater width were obtained when the plates were exposed at 37°C. until the plaques were established, followed by refrigeration and subsequent standing at 37°C., than when exposed at 37°C. followed by refrigeration and then set at 24°C. Exposed plates seeded either with 607 or Ph_1 and separately with the three phages at 37°C. for 48 hours, and allowed to stand at 24°C. were found to show rings after a few days. However, such ring formation is not as striking as when plates are subjected to alternate incubation and refrigeration. The rings were very narrow, and in some cases only a line of demarcation was evident in the zone of partial lysis around the plaque. No rings were found to develop when the plates were left continuously at 37°C. or at refrigeration temperature for several days.



(a) (b) (c)

FIG. 3. Concentric Ring Formation of Phage MT_3.
(a) (b) (c) indicate alternate refrigeration, 6°C., and incubation, 24°C.
(c) slightly enlarged.

In order to investigate the nature of the rings, areas III, IV, V, and p (Fig. 3(c)) were examined for phage activity. In each instance a small portion of each clear ring was picked with a mounted needle into 1 ml of sterile distilled water and assayed for plaque type. It was found that all the

areas thus examined produced large halo plaques. Similar plaques were obtained upon propagation of a sample of the areas with the host. Areas a, b, and c (Fig. 3(c)) between the rings were also investigated and found to contain phage. Attempts were made to propagate the bacterial growth between the clear rings, without success. With the small plaque phage (isolated from MT_2 and MT_{2a}), ring formation was not encountered. Of ten phages active for *M. smegmatis* strains, isolated by us, none has exhibited the property of ring formation.

Discussion

The halo, i.e., a zone of partial clearing about a plaque, has been of interest for some time. Sertic and Boulgakov[4,5] investigated these halos and concluded that they were caused by an enzyme which diffuses from the plaque and apparently digests certain capsular material of the bacteria, thus producing the halo. In further work[6,6a] Sertic attempted to show that the enzyme was a product of the phage and not of the bacteria. It is known that some bacteriophages produce a lysin of low molecular weight[7] which lyses the host. Such phages will produce halo plaques. The observation of ring formation, however, suggests no relationship between this phenomenon and that of halo formation.

Perhaps the closest apparent relationship to the ring formation is evidenced by a *Staphylococcus albus* phage described by Burnet and Lush[8]. This phage produced plaques which grew "indefinitely" and had the appearance of a gradually widening ring of lysis because of the resistance growth which grew inside the plaque.

The halos, as well as the rings produced by the *M. phlei* phages described in this study, were found to be the result of phage action rather than some other cause. The presence of phage between the clear rings would seem to indicate some adsorption of phage on to cells during diffusion under conditions unfavourable for lysis.

The phenomenon is possibly one of viral interference and on this hypothesis may be explained as follows. During the period of cold exposure the slowly diffusing phage is adsorbed on to cells under conditions unfavourable to lysis; that is to say, no growth of the host or too slow a growth and too few phage particles adsorbed. These infected cells, when favourable conditions are restored, still exhibit partial inhibition to lysis. Upon exposure of the plates to a higher temperature, the diffusion rate of the phage and the multiplication rate of the host cell again become suitable for lysis, giving rise to a ring. The plaques which were originally surrounded by small halos become plaques with halos many times the size of the initial one. The same explanation can possibly account for the few rings produced at 24°C. It would seem that the rate of multiplication of the host cell at this temperature is the limiting factor. It had been observed previously that the growth of 607 and Ph_1 at 24°C. was very slow in comparison to that at 37°C.

The small plaques produced by MT_2 and MT_{2a} phages were observed during a routine assay of stock phage. Previously, for some time, only large halo plaques were obtained. The possibility that the small and large plaque

phage were two different phages belonging to two different species within the mycobacteria, was investigated and discarded. It would appear that these small haloless plaques are probably spontaneous mutants which occurred during the multiplication of the phage. The fact that infection of the host cells with both types of phage yielded both types of plaques suggests that there may exist different metabolic pathways for phage growth in the cell. It has been shown that the interference effect, though applicable to many pairs of phages, breaks down completely when closely related phages are used[9]. Such may be the case here. This is further strengthened by the fact that other types of plaques appear which seem to be a result of genetic interactions between these two types of plaques (Fig. 2(d,e)). Interference effect is considered as a condition where two viruses (phages) are adsorbed on to the same host cells but only one is liberated upon lysis of the host. The multiplication of one phage is said to be suppressed by the presence of the other.

The small plaque phage is not capable of the ring formation, suggesting a difference in particle size. It is expected that the large halo plaque phage is characterized by a small phage particle and vice versa, as has been shown to be the case with other bacteriophages. In such an event the small plaque phage may not be capable of diffusing as rapidly as the large plaque phage. Unfortunately, no electron micrographs of the phages have been available to confirm this hypothesis. It would be of interest to determine whether the phages are motile and what part this motility played in the formation of rings.

Summary

1. *M. phlei* phages isolated from soil and the production of concentric rings about their plaques are described.

2. Two *M. phlei* phages, MT_2 and MT_{2a}, appear to be very closely related, if not alike. Both produce mutant phage.

3. These phages may prove of value in studies on genetic mutations.

ACKNOWLEDGEMENTS

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Recommended Qualification Requirements and Minimum Salaries for Public Health Personnel in Canada

CANADIAN PUBLIC HEALTH ASSOCIATION

IN 1946 the Canadian Public Health Association established a Committee on Salaries and Qualifications of Public Health Personnel. At the request of the Dominion Council of Health this committee carried out a Canada-wide survey of official public health agencies.

The Committee's report (Canad. J. Pub. Health, 1947, *38*: 1) contained data regarding the various salary ranges offered for the different types of professional and technical personnel that make up the official public health agency. Information about factors other than salary that affect income was included.

The second part of the report contained recommended educational qualification and experience requirements for the majority of jobs in health agencies and a suggested *minimum* salary level for each group or grade of position.

This report was adopted by the Dominion Council of Health on November 6, 1946, and distributed by the Department of National Health and Welfare.

The Executive Council of the Canadian Public Health Association, in approving the report at the annual meeting in 1947, recommended that the report be revised in 1948 in order to keep it up to date with present trends.

At the annual meeting of the Canadian Public Health Association in Montreal, May 29 - 31, 1951, the Committee on Salaries and Qualifications of Public Health Personnel was requested to revise the 1948 report.

The recruitment and maintenance of an efficient, qualified professional and technical staff is the major problem facing official health agencies today. While there has been an increase in the number of personnel employed by health agencies in Canada since 1948, there has also been an attempted extension of health services to a considerable number of communities previously not supplied. These new agencies have made the over-all shortage of trained public health personnel more acute and the apparent gain in total personnel is not as encouraging as it appears at first glance. Most agencies are still understaffed to a critical degree.

While in most cases there has been an over-all increase in the salaries paid in 1951 in comparison with those in 1948, the increases are not comparable with those received by other workers in Canada and do not compensate for the increased cost of living generally.

In nearly all groups the initial minimum salary is inadequate and it has become increasingly apparent that the small salary range of most positions is a major deterrent to professional people who contemplate public service. The small salary range, with increments usually confined to a period of a few years, not only affects recruitment but makes it very difficult to retain com-

This is the second revision of the Report on Salaries and Qualifications of Public Health Personnel. The original report was published by the Association in 1947 and the first revision in 1949.

petent workers. Public health cannot compete successfully with other professional fields in Canada or the United States. For people already engaged in the practice of public health, there is little or no monetary incentive to advancement, and this is one of the main reasons why so many well-trained workers have left public health during the past few years.

The standards of service, the initial training requirements, the postgraduate requirements and the in-service training standards have been raised and maintained at a higher level during the past decade. These steps were taken by the public health workers themselves in an effort to improve the quality of both the service and the type of person giving the service to the public.

It is extremely difficult to maintain this attitude of improvement and advancement in the face of the attitude that the public health worker is apparently worth no more to the agency after twenty years of service than he is after three or five years' service.

REVISION

During 1951 information regarding any salary or qualification changes that had been instituted since 1948 was gathered from 10 Provincial Health Departments, 149 Health Units, 23 City Health Departments, and the Department of National Health and Welfare. This material is presented in the body of the revised report and in the appended tables. The major portion of the data collected appears in the tables of the Appendix.

Salaries that are suggested for the various groups are *considered to be the minimum salary that should be used for that particular position or grade anywhere in Canada.* Areas or Provinces that have a generally higher economic status should make an upward adjustment of these suggested minima.

GENERAL RECOMMENDATIONS

The data regarding factors other than basic salary which affect the earned income of the salaried individual are, to all intents, similar to those of the original report.

Recommendations regarding these factors are as follows:

1. That all professional or technical personnel employed by official health agencies be employed on the understanding that they will receive, upon the recommendation of their employer, an annual increment up to a maximum salary, with competence in the performance of duties as the obviously sound basis for such recommendations. Maximum salaries must be comparable with those obtainable in professional or technical jobs of similar responsibility in private enterprise in the same region.
2. That all such employees of official health agencies be allowed to participate in a superannuation or pension scheme, financed by contributions from employee and employer, or some equivalent method. It is desirable that these pension plans be made reciprocal and it is recommended that health agencies investigate the feasibility of reciprocal arrangements. It is recommended that after a minimum of twenty years' service provision be made to hold superannuation in abeyance for a person changing employment until the retirement age adopted by the particular scheme, after which payment would begin on the basis of contributions made.
3. That automobiles be provided or car allowances be granted personnel whose duties require them to travel. Such allowances should not be regarded as forming part of the salary. The ownership of a car should not be a condition for employment. Where it is desirable for personnel to own their own cars and the agency does not provide a car, arrangements for financing the car should be made by the agency; this is most important for recruitment purposes.
4. That professional or technical employees receive, upon the completion of one year's employment, three full weeks' holidays with pay per annum; and in the case of personnel whose duties require them to be on call evenings and holidays, that this period be extended to four full weeks with pay, or that "in lieu time" pay be arranged to compensate for this extra work.
5. That employees receive cumulative sick leave equivalent to $1\frac{1}{2}$ days per month and that pay and allowances equivalent to a percentage of unused cumulative sick leave be given as a bonus to employees upon leaving or superannuation.
6. That provision be made in the budget of the health agency for professional training of personnel at postgraduate or refresher courses and attendance at scientific meetings.
7. That when qualified, experienced personnel are newly employed, their starting salary should be at the level that their previous experience would indicate.

RECOMMENDATIONS BY OCCUPATION

Each profession and technical occupation has been divided into salary groups with responsibility, experience, and training as the factors which govern the variation between groups. Personality qualifications have not been included in the recommendations, as their value can only be judged by the employing agency.

Authorities may find that the recommended groups in a specific profession do not suit their needs, in which case the groups can be adapted to fit these

needs. In order to classify those positions that are not specified, the authorities concerned should match the qualification requirements and responsibility of the position in question with those of one of the recommended groups in this report. In this way they will be able to classify the position under discussion.

It is realized that there are many persons now engaged in the practice of public health who have not received the formal educational training recommended. It is to be understood, in interpreting the recommended qualifications, that practical field experience obtained under competent supervision can be considered in special cases as an alternative to formal education and that these recommended qualification requirements may be adjusted to include those persons already employed who are without formal training but giving creditable service in public health. *However, the recommended qualifications should be adhered to when new appointments are being made.*

It should be noted that the term "basic minimum salary" in this report means the minimum salary as laid down for a specific position exclusive of such items as cost-of-living bonus, car or room and board allowances, etc.

In the 1948 report it was strongly recommended that the maximum salary of one group should not be limited to the level of the minimum of the next higher group. From a review of the salaries paid in 1951 it appears that many agencies are continuing to use this method of limiting salary schedules. The Committee can only point out again that such a practice is not only unnecessary and frequently unfair, but has led to much dissatisfaction among the senior employees in the lower income groups, and will continue to do so. Senior employees in the lower income groups who may not have the educational qualification for the next higher group but who have given long years of service, should be recompensed by increments in keeping with the quality of this service.

PHYSICIANS IN PUBLIC HEALTH AGENCIES

Since 1948 the salaries of public health physicians, as well as those of most other public health personnel, have shown a slight upward trend. In 1948, 97 per cent of the physicians employed full-time in public health were limited to a maximum salary of $7,000. In 1951, 90 per cent of physicians are still limited to $7,000 or less, while 52 per cent are limited to a maximum of $6,000. The initial salaries have shown a similar slight increase but 55 per cent of the positions still offer $5,500 or less as a starting salary. In the 1948 report considerable emphasis was given to one of the major faults of public health salary schedules in Canada—the discouragingly short range between the minimum and maximum salaries offered. It will be noted from the tables for 1951 that the situation in respect to salary ranges still obtains.

RECOMMENDATIONS

These recommendations are proposed as a basis or guide to authorities in the preparation of salary classification and schedules. The recommendations do not include cost-of-living bonus, car allowance, etc.

Group IA

Basic MINIMUM Salary $4,750 plus an annual increment of at least $250 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes physicians engaged in public health as assistant clinicians in treatment or public health clinics; junior school physicians; junior assistants in a health department at a provincial or city level; and other positions that do not require specialty training.

Qualifications:

Graduation in medicine from an approved university or registration by a provincial licensing authority, and a minimum of one year's rotating internship in a general hospital.

Group IB

Basic MINIMUM Salary $5,000 plus an annual increment of at least $250 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

As outlined for Group IA.

Qualifications:

In addition to the qualifications required for Group IA, at least one year in general practice.

It is from the above groups that personnel can be selected for postgraduate training in public health or one of the allied specialties.

Group II

Basic MINIMUM Salary $6,000 plus an annual increment of at least $300 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes physicians in such positions as medical officer of health of small cities or assistant health officer in health units; assistant to the director of a division at city or provincial level; district health officer in a large city; junior specialists in specialist services such as mental hygiene, maternal and child hygiene, tuberculosis, laboratories, etc.

Qualifications:

In addition to the qualifications required for Group I, a degree or diploma in public health from an approved university or, in the case of the allied specialties, postgraduate training of at least one year, recognized by the Royal College of Physicians and Surgeons of Canada as leading to certification in the specialty indicated; or equivalent supervised in-service training in a public health agency or in the specialty indicated.

Group III

Basic MINIMUM Salary $7,000 plus an annual increment of at least $300 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

CHART A

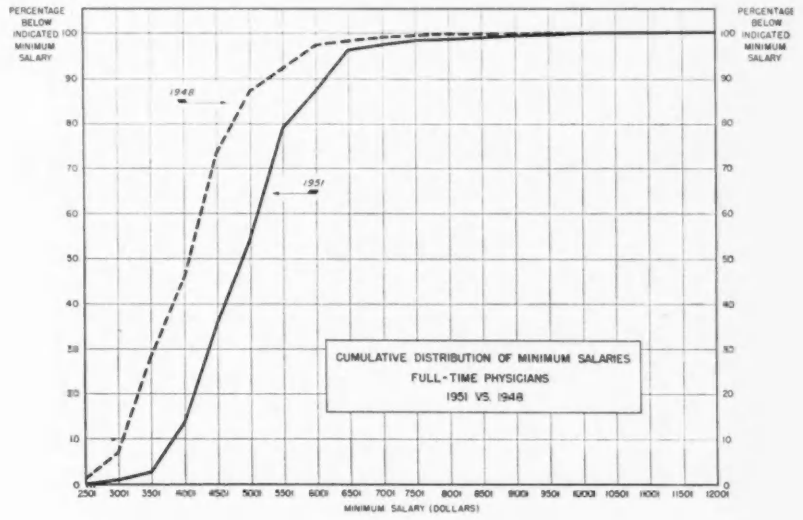

TABLE I

PERCENTAGE DISTRIBUTION OF MINIMUM AND MAXIMUM SALARIES
FULL-TIME PHYSICIANS—1951 vs. 1948

Amount	*Minimum*		*Maximum*	
	1951	1948	1951	1948
$ 2501-3000	...	1.2	...	1.2
3001-3500	1.0	6.0	0.6	...
3501-4000	1.7	21.0	0.8	18.5
4001-4500	10.6	17.6	0.3	10.2
4501-5000	22.3	27.7	20.8	10.4
5001-5500	18.9	13.8	8.7	32.9
5501-6000	24.2	5.0	20.9	15.1
6001-6500	8.2	5.4	22.5	3.9
6501-7000	9.6	0.8	14.8	4.5
7001-7500	1.1	0.7	6.0	2.3
7500-8000	1.0	0.5	1.8	0.5
8001-8500	0.3	0.2	1.0	...
8501-9000	0.3	...	0.6	...
9001-9500	0.3	...	0.4	0.2
9501-10,000	0.1	0.2	0.1	0.3
10,001-12,000	0.4	...	0.7	...
Total	100.0	100.0	100.0	100.0
Numbers	716	597	716	597

Duties

This group includes such positions as medical officer of health of a health unit or medium-sized city; director of a division in larger cities or similar divisions in provincial departments; chief specialist of services, such as tuberculosis, mental hygiene, etc., at the larger city level; regional consultant specialist for several health units or assistant chief of such services in a provincial service.

Qualifications:

In addition to the qualifications required for Group II, at least three years' training and experience in a public health department or in the specialty indicated. If such an incumbent holds the Certificate in Public Health from the Royal College of Physicians and Surgeons of Canada or the American Board of Preventive Medicine and Public Health, he should receive an additional sum of $500. (Minimum Salary, $7,500.)

Group IV

Basic MINIMUM Salary $9,000 plus an annual increment of at least $300 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as medical officer of health of large cities; assistant medical officer of health of metropolitan cities; regional medical officer of health supervising several health units; assistant deputy minister; director of a senior division or chief specialist in the senior or larger specialty groups at provincial level.

Qualifications:

In addition to the qualifications required for Group II, certification as a specialist by the Royal College of Physicians and Surgeons of Canada or the American Board of Preventive Medicine and Public Health.

Group V

Basic MINIMUM Salary $12,000 plus an annual increment of at least $400 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as provincial deputy minister of health or chief medical officer, and medical officer of health of metropolitan cities.

Qualifications:

In addition to the qualifications required for Group IV, a total of ten years' service in public health and proven administrative ability.

PUBLIC HEALTH NURSING PERSONNEL

There were 1,709 public health nursing personnel of official health agencies reported in 1951, which is an increase of 244 over the 1948 figure. The distribution of these positions is shown in Appendix B, Tables I and II.

The trend in public health nursing salaries shows as much variation as in any other public health group reviewed. In some areas qualified public health staff nurses are now being offered as a minimum more than most staff nurses were offered as a maximum in 1948. Whereas 60 per cent of the salaries were limited to $2,200 in 1948, only 20 per cent of staff nurses were so limited in

TABLE II

STAFF NURSES REQUIRING PUBLIC HEALTH QUALIFICATIONS
RELATION OF MINIMUM AND MAXIMUM SALARY

Minimum Amount	*Maximum Amount*																			
	1701-1800	1801-1900	1901-2000	2001-2100	2101-2200	2201-2300	2301-2400	2401-2500	2501-2600	2601-2700	2701-2800	2801-2900	2901-3000	3001-3100	3101-3200	3201-3300	3301-3400	3401-3500	3501-4000	4001-5000	*Total*
$1401 - 1500	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
1501 - 1600	—	12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12
1601 - 1700	—	—	—	30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	30
1701 - 1800	—	—	—	—	—	—	26	—	—	—	—	—	—	—	—	—	—	—	—	—	26
1801 - 1900	—	17	—	3	106	14	79	31	9	—	—	—	—	—	—	—	—	—	—	—	259
1901 - 2000	—	—	10	—	14	—	56	92	12	—	—	—	—	—	—	—	—	—	—	—	184
2001 - 2100	—	—	—	19	—	24	20	4	—	8	—	—	—	—	—	—	—	—	—	—	75
2101 - 2200	—	—	—	—	—	—	—	45	12	6	16	22	6	—	—	—	—	—	—	—	107
2201 - 2300	—	—	—	—	—	—	—	—	—	27	—	—	—	—	—	—	—	—	—	—	27
2301 - 2400	—	—	—	—	—	—	—	—	—	44	8	—	3	—	—	—	—	—	—	—	55
2401 - 2500	—	—	—	—	—	—	—	—	—	—	16	—	23	—	—	—	—	—	—	—	39
2501 - 2600	—	—	—	—	—	—	—	—	—	—	—	9	—	—	—	—	—	—	—	—	9
2601 - 2700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2701 - 2800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	165	—	—	—	—	—	165
2801 - 2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	—	—	4
2901 - 3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7	—	—	7
3001 - 3100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3100 - 3200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	80	80
Total	3	29	10	52	120	38	181	172	33	85	40	31	32	—	165	—	—	11	—	80	1,082

CHART B

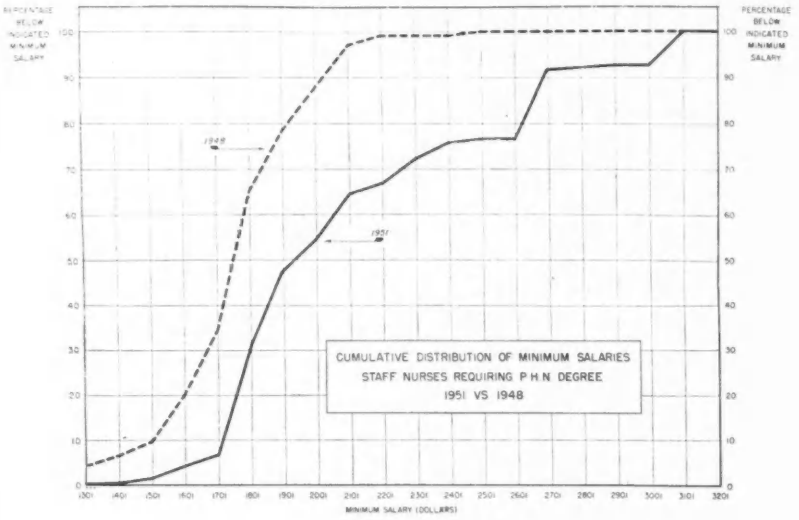

TABLE III

PERCENTAGE DISTRIBUTION OF MINIMUM AND MAXIMUM SALARIES
STAFF NURSES WITH PUBLIC HEALTH QUALIFICATIONS—1951 vs. 1948

Amount	*Minimum*		*Maximum*	
	1951	1948	1951	1948
$1301-1400	...	4.6	...	...
1401-1500	0.3	2.0	...	...
1501-1600	1.1	2.9	...	0.1
1601-1700	2.8	10.5	...	1.4
1701-1800	2.4	14.5	0.3	9.0
1801-1900	23.9	30.5	2.7	3.8
1901-2000	17.0	13.6	0.9	7.6
2001-2100	6.9	18.6	4.8	10.7
2101-2200	9.9	...	11.1	26.4
2201-2300	2.5	2.1	3.5	7.6
2301-2400	5.1	...	16.7	10.4
2401-2500	3.6	...	15.9	3.6
2501-2600	0.8	0.7	3.0	18.7
2601-2700	...	...	7.9	...
2701-2800	15.3	...	3.7	...
2801-2900	0.4	...	2.9	0.7
2901-3000	0.6	...	3.0	...
3001 3100	...	...	...	...
3101-3200	7.4	...	15.2	...
3201-3300	...	...	...	...
3301-3400	...	...	...	..
3401-3500	...	...	1.0	...
3501-4000	...	...	...	...
4001-5000	...	...	7.4	...
Total	100.0	100.0	100.0	100.0
Numbers	1,082	910	1,082	910

1951. Ninety-seven per cent started below $2,100 in 1948 and only 54 per cent started at $2,100 or below in 1951. The agencies that have been successful in establishing the higher salary schedules that appear in the tables are to be congratulated as they not only offer leadership to other groups but are bringing nursing salaries more in line with those obtainable in comparable professional positions. The agencies which have not reached this level as yet will, it is hoped, soon realize that the salaries must be raised to compete if public health services are to be continued in many areas. In most agencies the salary range is limited to a few hundred dollars between minimum and maximum, and as previously stated, the fact that the maximum is reached in a few years, tends to destroy the incentive for remaining in this field.

RECOMMENDATIONS

These recommendations are proposed as a basis or guide to authorities in the preparation of salary classification and schedules. The recommendations do not include cost-of-living bonus, car allowance, etc.

Group I

Basic MINIMUM Salary $2,160 plus an annual increment of at least $100 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as registered nurses employed in treatment clinics of official health agencies and nurses employed in health agencies as staff nurses who have no special qualifications in public health.

Qualifications:

A diploma in nursing from a recognized school of nursing plus provincial registration. Nurses who show an aptitude for public health work can be selected from this group for postgraduate training in order to qualify them for advancement to other groups.

Group II

Basic MINIMUM Salary $2,700 plus an annual increment of at least $150 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes recently qualified staff nurses employed in general public health or one of the specialized branches of public health.

Qualifications:

A degree in nursing including public health from a recognized university school of nursing; or a diploma in nursing from a recognized school of nursing plus at least one year's postgraduate training in public health nursing; or supervised postgraduate training in the specialty indicated. Nurses from Group I who have received supervised in-service training in public health or one of its allied specialties equivalent to the post-graduate training mentioned, may be included in this group.

Group III

Basic MINIMUM Salary $3,000 plus an annual increment of at least $180 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes senior staff nurses responsible for some supervision of a group of public health staff nurses.

Qualifications:

In addition to the qualifications required for Group II, at least three years' experience in public health nursing.

Group IV

Basic MINIMUM Salary $3,500 plus an annual increment of at least $180 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes supervisors and consultants.

Qualifications:

In addition to the qualifications required for Group II, a course in administration and supervision in public health nursing at an approved university and at least three years' experience in public health nursing.

Group V

Basic MINIMUM Salary $4,000 plus an annual increment of at least $200 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes directors of public health nursing in health units or cities with a nursing staff of 25 or over; directors of public health nursing in smaller provinces, assistant directors of public health nursing in large cities or provinces; educational supervisors at provincial level.

Qualifications:

In addition to the qualifications required for Group IV, a minimum of six years of experience in public health nursing, three of which should have been as a supervisor of nurses or an equivalent responsibility, and should include an adequate period of administration. It is desirable that this group should be drawn in the main from the nurses who have obtained a university degree in nursing.

Group VI

Basic MINIMUM Salary $5,000 plus an annual increment of at least $300 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes directors of public health nursing at provincial or large city level.

Qualifications:

In addition to the qualifications required for Group IV, a minimum of ten years' experience in public health nursing, of which at least two years should have been in an administrative capacity and three years in supervision or equivalent responsibility.

ENGINEERS IN PUBLIC HEALTH AGENCIES

There are fifty engineering positions reported in 1951, an increase of seven positions over 1948. The distribution of these positions is shown in Appendix C, Table I.

The ever-increasing importance of the trained public health engineer in the public health field, plus the fact that industry and private enterprise offer the young graduate a much more lucrative field, makes it essential for public health agencies to try to meet some of the competition. It is not logical to demand postgraduate training and increase the responsibility of a job without increasing the pay. Seventy per cent of the engineering positions still cannot expect to receive more than $4,500 as a maximum and 50 per cent are limited to $4,000 or less.

Here again, stress is laid upon the fact that, while the initial salaries for the junior groups is important in that it must compare favourably with other sources of professional income, much more stress must be placed on the expected maximum. It is the limited economic future that discourages both prospective applicants and present staff.

RECOMMENDATIONS

These recommendations are proposed as a basis or guide to authorities in the preparation of salary classification and schedules. The recommendations do not include cost-of-living bonus, car allowance, etc.

Group I

Basic MINIMUM Salary $3,600 plus an annual increment of at least $150 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes engineering positions that require a graduate engineer with no specialized experience or postgraduate training to perform routine engineering duties under the supervision of a qualified public health engineer.

Qualifications:

Graduation in engineering from an approved university.

Group II

Basic MINIMUM Salary $4,800 plus an annual increment of at least $200 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as assistant public health engineers employed in public health engineering under supervision at provincial or large city level.

Qualifications:

In addition to the qualifications for Group I, one year of postgraduate training in public health or sanitary engineering at an approved university. In exceptional cases, Group I engineers who have had at least four years' supervised experience in public health or sanitary engineering may be included in this group.

Group III

Basic MINIMUM Salary $6,000 plus an annual increment of at least $300 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as public health engineer of medium-sized cities, regional consultant for several health units, or assistant director of public health engineering at provincial level.

Qualifications:

In addition to the qualifications of Group II, five years' experience in public health engineering in a public health agency.

Group IV

Basic MINIMUM Salary $7,000 plus an annual increment of at least $300 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as director or senior specialist of public health engineering at provincial or large city level.

Qualifications:

At least one year and preferably two years of postgraduate training in public health engineering and, in addition, eight years' experience in the field of public health engineering; in the administrative positions, two years of administrative experience.

DENTISTS IN PUBLIC HEALTH AGENCIES

It is encouraging to note that twenty more positions for public health dentists are reported in 1951 than in 1948, making a total of sixty-three positions. The distribution of these positions is shown in Appendix D, Table I.

There has been an upward trend in public health dentists' salaries as in other public health groups. None of the assistant dentists could expect to make over $5,500 in 1948, whereas now, 50 per cent have a maximum of over $5,500. Positions requiring public health training are beginning to show salaries more in line with the responsibility of such positions, although here again, the salary ranges are very limited and are not sufficiently attractive to compete with private dental practice.

RECOMMENDATIONS

These recommendations are proposed as a basis or guide to authorities in the preparation of salary classification and schedules. The recommendations do not include cost-of-living bonus, car allowance, etc.

Group I

Basic MINIMUM Salary $4,500 plus an annual increment of at least $200 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as staff dentist carrying out a dental program under supervision in a public health agency.

Qualifications:

Graduation in dentistry from an approved university.

Group II

Basic MINIMUM Salary $5,800 plus an annual increment of at least $300 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as director of dental public health in departments of health in cities up to 75,000 population or in health units.

Qualifications:

In addition to the qualifications of Group I, a diploma or degree in dental public health from an approved university.

Group III

Basic MINIMUM Salary $7,000 plus an annual increment of $300 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as deputy director of dental divisions on the federal level or as director of dental divisions on the provincial level; or as director of dental divisions in departments of health in cities of 75,000 population and over, or as provincial regional director or consultant to a group of health units.

Qualifications:

In addition to the qualifications for Group III, at least three years' administrative experience in dental health services.

PUBLIC HEALTH LABORATORY PERSONNEL

There were 216 professional positions, not including physicians, reported in this survey as against 157 in 1948, and there was also an increase in technical positions from 299 to 365—a total of 581 positions. The distribution of these positions is tabulated in Appendix E, Tables I and II.

The wide range of salaries of the senior personnel and also of the assistant group indicates a wide range of responsibilities, due mostly to the differences in the size of public health laboratories.

All personnel employed by laboratories were not included in this survey as it was deemed unnecessary to include the personnel who, though employed in a public health laboratory, were not engaged in the technical work of the laboratory.

There has been an upward trend in the salaries of the professional personnel. In 1948 nearly 50 per cent of the senior positions had a maximum of over $4,000, whereas in 1951 nearly 75 per cent have a maximum of over $4,000, and in other professional positions there is a corresponding upward trend.

Since the 1948 figures were compiled, several agencies have had to raise the salary levels of the technical groups but while the levels are better, the salary ranges are still far from adequate. The average minimum salaries for technical groups I and II and the professional group I slightly exceed the minimum salaries recommended in the 1949 Report, but the average minimum salaries for all the other groups are lower than those recommended. There is an obvious discrepancy between the salaries laboratories have to pay new employees and the salaries that are obtainable for experienced personnel of the higher grades of either category already employed.

The Committee on Salaries and Qualifications of Laboratory Personnel believe that the following factors are of paramount importance in arriving at a scale of salaries that will secure and retain satisfactory personnel:

1. The excessive turnover in the technical groups, with its wastage of effort and money, can be reduced only by increasing the salaries to such an extent that men will be attracted to this field of work.

2. The greatest need at present in laboratories is more men as candidates for the positions in the higher professional groups. In order to induce university graduates to accept a career in the laboratory, salaries offered must be commensurate with comparable professional employment.

The situation in the laboratories across Canada in regard to recruiting and maintenance of staff has been very serious for several years. The work in laboratories has become more highly specialized and the increasing demand for more extensive laboratory procedures calls for more highly trained personnel and their assumption of more responsibility. This type of person is not available and cannot readily be recruited at the present salary levels offered in Canada.

RECOMMENDATIONS

Technical Staff

Group I

Basic MINIMUM Salary $1,620 plus an annual increment of at least $100 to a maximum salary comparable to that obtainable in positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes laboratory technicians with no special qualifications or experience engaged in technical work under the supervision of qualified personnel.

Qualifications:

An educational background equivalent to high school graduation and, in addition, one year's experience in a public health or equivalent laboratory.

Group II

Basic MINIMUM Salary $1,860 plus an annual increment of at least $100 to a maximum salary comparable to that obtainable in positions of similar responsibility in private enterprise in the same region.

Duties:

This group includes laboratory technicians engaged in technical work in a public health laboratory whose duties require the assumption of some responsibility in the preparation of media or specimens, the examination of specimens, or similar laboratory procedures.

Qualifications:

In addition to the requirements of Group I, three years' experience in public health or equivalent laboratory.

Group IIIA

Basic MINIMUM Salary $2,520 plus an annual increment of at least $120 to a maximum salary comparable to that obtainable in positions of similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as junior laboratory assistants and requires the assumption of part of the responsibility for the operation of a section of the laboratory.

Qualifications:

Preferably a specialist certificate from the Canadian Society of Laboratory Technologists or its equivalent and, in addition, five years' supervised training in a public health or equivalent laboratory.

Group IIIB

Basic MINIMUM Salary $2,880 plus increments as above.

This group of senior laboratory assistants will have the same basic qualifications as Group IIIA, but because of exceptional merit they will be in a position of senior responsibility.

Professional Staff

Group I

Basic MINIMUM Salary $2,700 plus an annual increment of at least $120 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as junior assistant bacteriologist, chemist, or serologist in a public health laboratory.

Qualifications:

Graduation from an approved university, preferably having majored in bacteriology or chemistry.

Group II

Basic MINIMUM Salary $3,600 plus an annual increment of at least $150 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:
This group includes such positions as senior assistant bacteriologist, chemist or serologist in a public health laboratory.

Qualifications:
In addition to the requirements of Group I, a year's postgraduate training in their specialty at an approved university or equivalent supervised training in a public health laboratory plus a period of two years' service in a public health laboratory.

Group III

Basic MINIMUM Salary $4,800 plus an annual increment of at least $250 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:
This group includes such positions as associate bacteriologist, chemist or serologist in a public health laboratory.

Qualifications:
A master's degree and at least three years' varied experience in a large public health laboratory.

Group IV

Basic MINIMUM Salary $6,000 plus an annual increment of at least $300 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:
This group includes such positions as principal bacteriologist, chemist or serologist in a public health laboratory.

Qualifications:
A doctorate in bacteriology or chemistry and, in addition, five years' experience in public health laboratory procedures and the administrative or research experience required for the position.

Group V

Basic MINIMUM Salary $6,500 plus an annual increment of at least $300 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:
This group includes such positions as assistant director of a public health laboratory.

Qualifications:
A doctor's degree in bacteriology or chemistry and, in addition, five years' experience in public health laboratory procedures, of which two years should have been in an administrative capacity.

Group VI

This group includes directors of public health laboratories, and as such positions are held by personnel of widely varying background, the recommended salary and necessary qualifications are not included in this report. Each agency may define its own specifications for this position by comparing the qualifications and training of the incumbent with positions of equal responsibility in other branches of public health.

GRADUATES IN VETERINARY MEDICINE

There were 392 positions reported for this group as against 338 in 1948. The distribution of salaries is shown in Appendix F, Table I. The veterinarians employed by the Federal Department of Agriculture as meat inspectors have increased from 301 in 1948 to 325 in 1951.

There has not been as marked an improvement in salary levels since the 1948 report as there was in the interval from 1946-48. However, where only 6.2 per cent could expect to attain a salary of more than $4,000 in 1948, 87.5 per cent can expect to reach a maximum of over $4,000 in 1951. While data on the number of agencies requiring public health qualifications for veterinarians employed in public health work were not obtained, it is understood that these qualifications are being required more frequently by health agencies.

While this trend is encouraging, the salary levels must not be accepted as adequate because the private practice of veterinary medicine is still much more attractive from a monetary standpoint. If public health, in addition, is to require postgraduate training, then salary levels must be brought closer to those obtainable in private practice in order to compete successfully for the available graduates.

RECOMMENDATIONS

These recommendations are proposed as a basis or guide to authorities in the preparation of salary classification and schedules. The recommendations do not include cost-of-living bonus, car allowance, etc.

Group I

Basic MINIMUM Salary $3,800 plus an annual increment of at least $150 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as dairy-herd inspectors, meat inspectors, and other positions requiring graduates in veterinary medicine to work under supervision.

Qualifications:

Graduation from an approved university school of veterinary medicine.

Group II

Basic MINIMUM Salary $5,300 plus an annual increment of at least $200 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as assistant chief of a division of food control of large health departments or chief inspector of health units or other positions where the duties require a qualified veterinarian to assume some of the responsibility of the operation of a food control or sanitation division in a health agency.

Qualifications:

In addition to the requirements of Group I, a diploma or degree in veterinary public health from an approved university and one year's supervised experience in a health agency; or in lieu of these qualifications, four years' supervised experience in a health agency.

Group III

Basic MINIMUM Salary $6,000 plus an annual increment of at least $300 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as chief inspector of a division of food control or chief sanitary inspector in a large health department or other positions requiring qualified veterinarians to assume responsibility for the supervision of a staff of inspectors.

Qualifications:

In addition to the qualifications of Group II, five years' experience in veterinary medicine in public health. In exceptional cases, personnel who have had ten years' experience in veterinary public health may be included in this group.

Group IV

Basic MINIMUM Salary $7,000 plus an annual increment of at least $300 to a maximum salary comparable to that obtainable in professional positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as director of a division of food control of metropolitan cities or consultant veterinarian at larger provincial level.

Qualifications:

In addition to the Diploma in Veterinary Public Health a further year in postgraduate study at an approved university plus six years' experience in a public health agency, two of which should have been in an administrative capacity.

PUBLIC HEALTH STATISTICAL PERSONNEL

In 1951 there were 28 positions reported in this group as against 19 in 1948. As the survey does not include the general clerical employees of health agencies and as it was somewhat difficult to decide at what point in training and experience a non-professional person becomes a public health statistical clerk, the positions reported may not represent the entire group of public health statistical personnel from the agencies surveyed.

The wide variation in the salary range shown in 1948 still exists and for the same reasons. There is a wide range of responsibility and training requirements for the incumbents of these positions. There has been more improvement in the salary levels since the 1948 report than there was in the interval between 1946-1948. However, the field is still critically short of personnel and, as mentioned in the 1948 report, training facilities in Canada are still practically non-existent.

RECOMMENDATIONS

These recommendations are proposed as a basis or guide to authorities in the preparation of salary classification and schedules. The recommendations do not include cost-of-living bonus.

For the purpose of this report, public health statistical personnel have been divided into four groups, including both professional and clerical groups. Medical personnel with training in public health statistics are not included in these classifications as they are included in the recommendations regarding physicians.

Group I

Basic MINIMUM Salary $2,400 plus an annual increment of at least $120 to a maximum salary comparable to that obtainable in positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as statistical clerks whose duties require knowledge of methods of collection and tabulation of public health statistics and the ability to supervise, under senior direction, a group of clerical staff engaged in the compilation of statistical data.

Qualifications:

Four years' supervised experience in statistical work in a public health or similar agency.

Group II

Basic MINIMUM Salary $3,000 plus an annual increment of at least $120 to a maximum salary comparable to that obtainable in positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as assistant statistician in large health departments or chief statistical clerk in smaller cities or health units. Duties should include responsibility for the collection and presentation of the public health statistical data or a section of it under the guidance of a consultant statistician.

Qualifications:

Graduation from a recognized university where studies include the elements of statistical methods, and, in addition, one year's supervised experience in public health statistics in a public health agency. Exceptional personnel who by experience have acquired an educational training equivalent to the above may be included in this group. A minimum of six years' supervised experience should be required as an equivalent.

Group III

Basic MINIMUM Salary $4,000 plus an annual increment of at least $200 to a maximum salary comparable to that obtainable in positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as assistant director of statistical divisions in public health agencies and regional consultant statistician for a group of health units.

Qualifications:

In addition to the requirements of Group II, one year's postgraduate training in public health statistics or a course of study leading to a certificate in public health at a recognized university. As in Group II, exceptionally well trained personnel who have not had formal academic training may be included in this group if they have had nine years' supervised training in public health statistics.

Group IV

Basic MINIMUM Salary $6,000 plus an annual increment of at least $300 to a maximum salary comparable to that obtainable in positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as director of public health statistical services in large health agencies. These personnel should be capable of interpreting and analyzing statistical data and directing statistical research programs.

Qualifications:

Graduation from a recognized university plus two years' postgraduate study, one year of which should have been in statistical methods and theory, preferably leading to a master's degree, and the other in public health. In addition, five years' experience in a statistical division of a public health agency, of which one year should have been in an administrative capacity.

NUTRITIONISTS IN PUBLIC HEALTH AGENCIES

There were 33 positions reported in this group in 1951 as against 28 in 1948. The salary distribution is shown in Appendix H, Table I.

There has been a fairly reasonable upward trend in the salary levels of nutritionists since 1948 but the opportunities offered for university graduates with postgraduate training are still far from bright. All but five of the nutritionists in public health agencies in Canada are limited to a maximum of $3,500 or less.

RECOMMENDATIONS

These recommendations are proposed as a basis or guide to authorities in the preparation of salary classification and schedules. The recommendations do not include cost-of-living bonus, car allowance, etc.

For the purpose of this report, nutritionists have been divided into two groups. Medical personnel with training in nutrition are not included in these classifications as they have been included amongst the recommendations for public health physicians.

Group I

Basic MINIMUM Salary $3,000 plus an annual increment of at least $120 to a maximum salary comparable to that obtainable in positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as assistant nutritionists in provincial or city health departments or other positions requiring a qualified nutritionist to be employed under supervision.

Qualifications:

Graduation from a recognized university in a course majoring in home economics, food chemistry, nutrition or related subjects and, in addition, a minimum of one year's postgraduate study in the field of public health. Previous experience in the general field of nutrition is desirable.

Group II

Basic MINIMUM Salary $4,000 plus an annual increment of at least $200 to a maximum salary comparable to that obtainable in positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as assistant to the director of a division of nutrition at a provincial or large city level, regional consultant nutritionist for several health units, or other senior nutritionist position.

Qualifications:

In addition to the qualifications of Group I, three years' experience in public health nutrition.

SANITARY INSPECTORS

There were 547 positions reported in 1951 as against 492 in 1948. The distribution of these salaries is shown in Appendix I, Table I. There has been a similar upward trend in the salary levels of this group as in most of the other groups and opportunities in senior positions are somewhat better. In 1948 only two sanitary inspectors in staff positions could expect to obtain over $3,000 whereas in 1951, 26 per cent can expect maximum salaries of over $3,000.

RECOMMENDATIONS

These recommendations are proposed as a basis or guide to authorities in the preparation of salary classification and schedules. The recommendations do not include cost-of-living bonus, car allowance, etc.

Group I

Basic MINIMUM Salary $2,500 plus an annual increment of at least $120 to a maximum salary comparable to that obtainable in positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes positions that require a qualified sanitary inspector to carry out inspectional duties under the supervision of a senior member of the public health agency.

Qualifications:

The Certificate in Sanitary Inspection (Canada) or its equivalent.

Group II

Basic MINIMUM Salary $3,000 plus an annual increment of at least $150 to a maximum salary comparable to that obtainable in positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes such positions as senior inspector in smaller health agencies.

Qualifications:

(*a*) The Certificate in Sanitary Inspection (Canada) or its equivalent, plus five years' experience in environmental sanitation in a public health agency; *or*

(*b*) One year's postgraduate training in public health plus one year's experience in environmental sanitation in a public health agency.

Group III

Basic MINIMUM Salary $3,500 plus an annual increment of at least $150 to a maximum salary comparable to that obtainable in positions with similar responsibility in private enterprise in the same region.

Duties:

This group includes senior inspectors of large health agencies and regional or provincial supervisors of several health units.

Qualifications:

(*a*) The Certificate in Sanitary Inspection (Canada) or its equivalent, plus ten years' experience in environmental sanitation in a public health agency, at least two of which should have been in a supervisory or administrative capacity; *or*

(*b*) One year's postgraduate training in public health, plus five years' experience in environmental sanitation in a public health agency, at least two of which should have been in a supervisory or administrative capacity.

APPENDIX A

TABLE I

MINIMUM AND MAXIMUM SALARIES, PUBLIC HEALTH PHYSICIANS, BY EMPLOYMENT

Amount	*Federal and Provincial*		*Health Units*		*Cities*		*Total*	
	Minimum	*Maximum*	*Minimum*	*Maximum*	*Minimum*	*Maximum*	*Minimum*	*Maximum*
$3001 - 3500	6	3	...	...	1	1	7	4
3501 - 4000	10	6	1	...	1	...	12	6
4001 - 4500	37	1	6	1	33	...	76	2
4501 - 5000	37	48	111	72	12	29	160	149
5001 - 5500	80	25	31	32	24	5	135	62
5501 - 6000	132	92	15	30	26	28	173	150
6001 - 6500	46	124	4	27	9	10	59	161
6501 - 7000	65	84	1	7	3	15	69	106
7001 - 7500	4	27	2	...	2	16	8	43
7501 - 8000	4	6	...	...	3	7	7	13
8001 - 8500	1	1	...	2	1	4	2	7
8501 - 9000	2	4	...	...	...	...	2	4
9001 - 9500	...	3	...	...	2	...	2	3
9501 - 10,000	1	1	...	...	...	...	1	1
10,001 - 12,000	2	2	...	...	1	3	3	5
Total	427	427	171	171	118	118	716	716

APPENDIX A

TABLE II

MINIMUM AND MAXIMUM SALARIES, PUBLIC HEALTH PHYSICIANS, BY POSITION

Amount	*Deputy Ministers or Chief Provincial Health Officers*		*Assistant Deputy Ministers*		*Directors of Divisions Provinces and Cities*		*Medical Officers of Health Cities*		*Medical Officers of Health Units*		*Positions Requiring Special Qualifications*		*Positions* Not *Requiring Special Qualifications*		*Total*	
	Min.	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*
3001–3500	—	—	—	—	—	—	1	1	4	3	—	—	2	—	7	4
3501–4000	—	—	—	—	—	—	1	—	1	4	1	—	9	2	12	6
4001–4500	—	—	—	—	—	—	3	—	6	1	25	1	42	—	76	2
4501–5000	—	—	1	—	8	6	3	1	83	68	27	24	38	50	160	149
5001–5500	1	—	—	—	7	—	11	2	40	23	50	12	26	25	135	62
5501–6000	2	1	3	2	45	8	3	10	14	26	104	63	2	40	173	150
6001–6500	1	—	—	1	22	23	6	5	7	22	16	101	7	9	59	161
6501–7000	2	2	2	3	14	33	3	3	1	9	35	45	12	11	69	106
7001–7500	1	3	—	—	—	26	2	6	2	—	3	8	—	—	8	43
7501–8000	1	2	1	—	4	3	1	3	—	—	—	4	—	1	7	13
8001–8500	—	—	—	—	1	1	1	4	—	2	—	—	—	—	2	7
8501–9000	1	1	—	1	1	2	—	—	—	—	—	—	—	—	2	4
9001–9500	—	—	—	—	—	—	2	—	—	—	—	3	—	—	2	3
9501–10,000	—	—	—	—	1	1	—	—	—	—	—	—	—	—	1	1
10,001–12,000	2	2	—	—	—	—	1	3	—	—	—	—	—	—	3	5
Total	11	11	7	7	103	103	38	38	158	158	261	261	138	138	716	716

APPENDIX B

TABLE I

MINIMUM AND MAXIMUM SALARIES, PUBLIC HEALTH NURSING PERSONNEL BY TYPE OF POSITION

A—Staff nurse without public health qualifications.
B—Staff nurse requiring public health qualifications.
C—Director, Supervisor and other senior positions requiring public health qualifications.

Amount	*A*		*B*		*C*		*Total*	
	Minimum	*Maximum*	*Minimum*	*Maximum*	*Minimum*	*Maximum*	*Minimum*	*Maximum*
$1201 - 1300	240	...	...	...	...	...	240	...
1301 - 1400	...	...	...	...	...	...	...	...
1401 - 1500	30	...	3	...	...	...	33	...
1501 - 1600	8	...	12	...	...	...	20	...
1601 - 1700	98	...	30	...	...	...	128	...
1701 - 1800	4	279	26	3	1	...	31	282
1801 - 1900	25	4	259	29	3	...	287	33
1901 - 2000	...	3	184	10	...	...	184	13
2001 - 2100	27	1	75	52	1	...	103	53
2101 - 2200	3	...	107	120	12	3	122	123
2201 - 2300	...	21	27	38	4	...	31	59
2301 - 2400	...	111	55	181	29	1	84	293
2401 - 2500	...	7	39	172	36	7	75	186
2501 - 2600	...	9	9	33	11	2	20	44
2601 - 2700	...	...	...	85	26	30	26	115
2701 - 2800	...	...	165	40	7	15	172	55
2801 - 2900	...	...	4	31	3	4	7	35
2901 - 3000	...	...	7	32	11	45	18	77
3001 - 3100	...	...	...	...	3	5	3	5
3101 - 3200	...	...	80	165	3	14	83	179
3201 - 3300	...	...	...	...	21	7	21	7
3301 - 3400	...	...	...	...	6	3	6	3
3401 - 3500	...	...	...	11	2	14	2	25
3501 - 4000	1	1	...	...	10	30	11	31
4001 - 5000	...	...	...	80	2	10	2	90
5001 - 6000	...	...	...	...	...	1	...	1
Total	436	436	1082	1082	191	191	1709	1709

APPENDIX B

TABLE II

MINIMUM AND MAXIMUM SALARIES, PUBLIC HEALTH NURSING PERSONNEL, BY AGENCY

Amount	*Federal and Provincial*		*Health Units or Districts*		*Cities*		*Total*	
	Minimum	*Maximum*	*Minimum*	*Maximum*	*Minimum*	*Maximum*	*Minimum*	*Maximum*
$1201 - 1300	...	...	240	...	...	...	240	...
1301 - 1400	...	...	...	...	...	...	...	...
1401 - 1500	3	...	30	...	...	...	33	...
1501 - 1600	...	...	12	...	8	...	20	...
1601 - 1700	...	...	31	...	97	...	128	...
1701 - 1800	...	3	22	270	9	9	31	282
1801 - 1900	...	1	199	29	88	3	287	33
1901 - 2000	6	...	172	11	6	2	184	13
2001 - 2100	20	...	52	53	31	...	103	53
2101 - 2200	45	3	54	120	23	...	122	123
2201 - 2300	2	...	9	21	20	38	31	59
2301 - 2400	8	3	39	110	37	180	84	293
2401 - 2500	12	26	10	134	53	26	75	186
2501 - 2600	...	9	7	33	13	2	20	44
2601 - 2700	14	17	5	32	7	66	26	115
2701 - 2800	3	1	4	41	165	13	172	55
2801 - 2900	...	2	1	13	6	20	7	35
2901 - 3000	7	26	1	14	10	37	18	77
3001 - 3100	...	...	1	2	2	3	3	5
3101 - 3200	...	9	2	3	81	167	83	179
3201 - 3300	1	3	3	4	17	...	21	7
3301 - 3400	2	2	...	...	4	1	6	3
3401 - 3500	1	7	...	1	1	17	2	25
3501 - 4000	6	10	...	3	5	18	11	31
4001 - 5000	...	8	...	...	2	82	2	90
5001 - 6000	...	...	...	...	...	1	..	1
Total	130	130	894	894	685	685	1709	1709

APPENDIX C

TABLE I

MINIMUM AND MAXIMUM SALARIES, GRADUATE ENGINEERS

Amount	*Engineers*		*Assistant Engineers*	
	Minimum	*Maximum*	*Minimum*	*Maximum*
$2201 - 2400	—	—	2	—
2401 - 2600	—	—	—	—
2601 - 2800	—	—	5	2
2801 - 3000	—	—	13	—
3001 - 3500	1	—	1	5
3501 - 4000	6	2	10	15
4001 - 4500	5	5	2	6
4501 - 5000	2	2	—	5
5001 - 6000	3	8	—	—
Total	17	17	33	33

APPENDIX D

TABLE I

MINIMUM AND MAXIMUM SALARIES, DENTISTS EMPLOYED FULL-TIME BY PUBLIC HEALTH AGENCIES

Amount	*Directors of Divisions or Service*		*Assistant Dentists*	
	Minimum	*Maximum*	*Minimum*	*Maximum*
$3001 - 3200	—	—	3	—
3201 - 3400	2	1	—	—
3401 - 3600	2	1	—	—
3601 - 3800	—	—	—	—
3801 - 4000	—	1	1	3
4001 - 4500	2	1	17	1
4501 - 5000	7	—	14	9
5001 - 5500	3	7	9	10
5501 - 6000	2	4	—	21
6001 - 7000	1	4	—	—
Total	19	19	44	44

APPENDIX E

TABLE I

MINIMUM AND MAXIMUM SALARIES, PUBLIC HEALTH LABORATORY PERSONNEL PROFESSIONAL STAFF

	Directors and Senior Bacteriologists Serologists and Chemists		*Assistant Bacteriologists Serologists and Chemists*	
	Minimum	*Maximum*	*Minimum*	*Maximum*
$1601 - 1800	...	...	21	...
1801 - 2000	...	...	...	...
2001 - 2200	...	...	22	18
2201 - 2400	...	...	1	...
2401 - 2600	...	...	...	...
2601 - 2800	5	1	42	25
2801 - 3000	...	...	30	3
3001 - 3500	13	4	6	44
3501 - 4000	2	12	28	34
4001 - 4500	4	5	18	2
4501 - 5000	10	2	9	42
5001 - 6000	3	10	...	9
6001 - 7000	1	3	...	...
7001 - 10,000	1	2	...	...
Total	39	39	177	177

TABLE II

MINIMUM AND MAXIMUM SALARIES, PUBLIC HEALTH LABORATORY PERSONNEL TECHNICAL STAFF

Amount	*Minimum*	*Maximum*
$1000 and under	81	—
1001 - 1200	1	—
1201 - 1400	48	49
1401 - 1600	83	69
1601 - 1800	10	25
1801 - 2000	26	23
2001 - 2200	66	66
2201 - 2400	2	—
2401 - 2600	25	58
2601 - 2800	11	...
2801 and over	12	...
Total	365	365

APPENDIX H

TABLE I

MINIMUM AND MAXIMUM SALARIES, PUBLIC HEALTH NUTRITIONISTS

Amount	*Minimum*	*Maximum*
$1601 - 1800	3	—
1801 - 2000	2	—
2001 – 2200	4	2
2201 - 2400	2	—
2401 - 2600	7	5
2601 - 2800	6	4
2801 - 3000	1	2
3001 - 3500	6	15
3501 - 4000	2	5
Total	33	33

APPENDIX I

TABLE I

MINIMUM AND MAXIMUM SALARIES, PUBLIC HEALTH SANITARY INSPECTORS

Amount	*Chief Sanitary Inspectors*		*Sanitary Inspectors*	
	Minimum	*Maximum*	*Minimum*	*Maximum*
$1200 - 1400	—	—	—	—
1401 - 1600	—	—	3	—
1601 - 1800	—	—	27	—
1801 - 2000	—	—	103	—
2001 - 2200	1	—	140	17
2201 - 2400	3	—	67	46
2401 - 2600	12	—	24	18
2601 - 2800	4	3	36	170
2801 - 3000	6	8	91	119
3001 - 3500	17	18	3	124
3501 - 4000	4	16	6	6
4001 - 5000	—	2	—	—
Total	47	47	500	500

APPENDIX F

TABLE I

MINIMUM AND MAXIMUM SALARIES, VETERINARIANS*

Amount	*Minimum*	*Maximum*
$2601 - 2800	1	—
2801 - 3000	27	—
3001 - 3500	46	10
3501 - 4000	165	39
4001 - 4500	134	31
4501 - 5000	19	292
5001 - 6000	—	20
Total	392	392

*This includes 325 veterinarians employed as meat inspectors by the Federal Department of Agriculture as at April 1951.

APPENDIX G

TABLE I

MINIMUM AND MAXIMUM SALARIES, PUBLIC HEALTH STATISTICAL PERSONNEL

Amount	*Minimum*	*Maximum*
$1801 - 2000	1	—
2001 - 2200	6	—
2201 - 2400	1	6
2401 - 2600	2	1
2601 - 2800	2	1
2801 - 3000	2	2
3001 - 3500	3	3
3501 - 4000	9	3
4001 - 4500	—	5
4501 - 5000	1	5
5001 - 6000	1	2
Total	28	28

Canadian Journal of Public Health

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ECONOMIC SECURITY FOR OLD AGE

THE FIRST monthly payments have been made under the new old-age pension program, and another step has been taken in Canada's program of social security. For some years there have been differences of opinion about the details of a pension program. What age groups should be covered, the basis of eligibility, the amount of the pension, the methods of administration and of raising the funds, have been the subjects of conflicting proposals. But there has been substantial agreement on the principle of the provision of economic security for old people, by a method that does not deprive them of dignity or self-respect. From the recommendations of the Joint Committee of Senate and House of Commons on Old Age Security, in June 1950, to the inauguration of the new program, only eighteen months have elapsed. The measure passed the House of Commons without a dissenting vote, and all the Provincial Governments are participating.

The new program is a dual one, providing old age pensions for persons over 70 and old age assistance for needy persons between 65 and 70.

For persons over 70 the means test is eliminated by providing a universal pension at a flat rate of forty dollars a month. Residence in Canada for a suitable period and proof of age, not economic need, are the criteria for eligibility. Under the previous Old Age Pensions Act, nearly half of all Canadians over 70 could qualify under the means test, and the Government of Canada paid 75 per cent of the cost to the Provinces, which administered the program. Under the Old Age Security Act, the Federal Government pays the full cost of the universal pension to persons over 70 and administers the program directly through its own regional offices and civil servants, as in the administration of family allowances.

For persons between 65 and 70, a retirement pension is now offered for the first time. It also is provided at a rate of forty dollars a month, subject to reduction if the total income, including pension, exceeds the maximum permitted under the means test. Thus it is very much like the old age pensions program in operation from 1928 to 1951 for those over 70. It is provided only for persons

in need. The Federal Government establishes the conditions and pays half the cost of the pensions, and the Provincial Governments administer the service.

The cost of the two programs, apart from administration, is estimated at $375 million a year—about $325 million for old age security and the balance for old age assistance. Of this total, the Federal Government will provide nearly $350 million.

Age has long been recognized as one of the chief causes of economic insecurity and dependence on public support; even primitive societies had to deal with this social problem. In England for more than three centuries local poor relief was virtually the only social provision for old age. The Elizabethan Poor Law of 1601 marked the assumption of responsibility by government for the relief of destitution, and laid this responsibility on the smallest unit of the local government, the parish. Along with the widow, the orphan, the blind, the crippled, the insane, the vagrant, the drunkard, and other paupers, poor and sick old persons were subjected to the extortion and tyranny of the overseer of the poor and herded together in the mixed workhouse. Even in periods and places where more humane practices prevailed, relief of need in old persons was limited by the parsimony of local government officials and by the inadequate tax resources of the local community.

Despite its obvious limitations, the poor-relief approach to economic security for the aged seemed to work fairly well in an unmechanized, moderately prosperous agricultural economy. The break with this tradition came first in England as the transition to a predominantly industrial economy was completed. Social surveys in London about 1890 revealed that a large proportion of the population did not earn enough during their working years to provide for old age. Studies in the United States in the 1920's led to the same conclusion. In both countries, national provision of old age pensions followed in about a decade.

The case for putting needy old persons in a preferred category of those entitled to public assistance was argued eloquently by Winston Churchill in 1908, the year in which the first English Old Age Pensions Act was introduced:

> "I do not agree with those who say that every man must look after himself and that the intervention by the State in such matters as I have referred to will be fatal to his self-reliance, his foresight and his thrift . . .
>
> "If terror be an incentive to thrift, surely the benefits of the system which we have abandoned ought to have stimulated thrift as much as anything could have been stimulated in this world. The mass of the labouring poor have known that unless they made provision for their old age, betimes they would perish miserably in the workhouse. Yet they have made no provision . . . for they have never been able to make such provision . . . It is a great mistake to suppose that thrift is caused only by fear; it springs from hope as well as from fear; where there is no hope, be sure there will be no thrift."

The Canadian old age pensions program, which began in 1928, was modelled closely on the first British Old Age Pensions Act and subject to a means test. The arguments against having a means test program as the only national provision for economic security for the aged are well known. A means test is costly and hard to administer equitably on a national basis. The stigma of social failure and the humiliation of being a public charge must be borne by all who receive such assistance, even those who, through no fault of their own, have been unable to

provide for their retirement from their own resources. Finally, it is argued that a means test program penalizes the thrifty, who have sacrificed to save for their old age. When, even in a period of prosperity, about half of all Canadians over 70 were able to qualify for the pension under the means test, it seemed logical to put the program on a different basis.

The Canadian Government decided against a contributory plan and followed the Beveridge principle of a flat-rate minimum subsistence pension, in the expectation that individuals would supplement this from their private savings. The provision for the group from 65 to 70 on a means-test basis was probably dictated by the estimated cost of a more comprehensive program. One may anticipate that the provision for this group will be made more comprehensive as time goes on and resources permit. Here, perhaps, is a suitable place to develop a contributory program according to the New Zealand pattern which would come into force gradually as more and more persons reached retirement age after having made contributions for a sufficient number of years. It is recognized that the old age pensions program will become more costly year by year, for some time to come. The Joint Committee on Old Age Security in 1950 expressed the belief that the ageing of our population would raise the cost of the existing program to over $500 million annually by 1971.

This problem of cost, and a partial solution for it, was well stated in the report of a survey committee in England in 1946[1]:

> "On the one hand, there is the natural desire of the community to minister generously to the needs and comfort of old age; on the other hand, the change which is taking place in the age distribution of the population will, in the not too distant future, result in so great a preponderance of those in the older age groups that, unless the able-bodied among them work after they reach pensionable age, the burden of maintaining the aged may become so great as to result in a lowering of the national standard of living."

The importance of helping to maintain old persons in employment, as long as their health will permit, cannot be overstressed. The value to the individual, as well as to the community, of continuing to work at something socially useful is now widely recognized. But this is not easy to arrange in an industrial economy, and it is not possible at all for most old people, except in periods of full employment. This is one of the great challenges before us as we develop social security programs that go beyond the mere provision of financial assistance.

The most recent statistics on Canada's gross national product and national income are reassuring. Against a figure of $23 billion, our expenditures for social security measures are seen in their proper light. The rate of increase in our national income seems more than sufficient to meet the rising costs of old age security. We are not yet spending on health and social services anything like the 15 per cent of total national production that some economists set as the proper limit for such expenditures. If employment and production can be maintained, it seems clear that we shall be able to finance an adequate program for the aged, in addition to other necessary health and social services.

[1]Old People. Report of a Survey Committee on the Problems of Ageing and the Care of Old People, under the chairmanship of B. Seebohm Rowntree, C.H., LL.D. Published for the trustees of the Nuffield Foundation by Geoffrey Cumberledge, Oxford University Press, London, 1947.

NEWS

British Columbia

As a result of a visit of Dr. K. C. Charron, chairman of the National Civil Defence Health Services planning group, progress is being made in this Province in line with the recommendations of the proposed action program outlined by Dr. Charron. Two committees have now been set up: the civil defence health services planning committee, under the chairmanship of Dr. T. H. Patterson, director of the Division of Environmental Management of the Health Branch, Department of Health and Welfare; and the civil defence welfare services planning committee, under the chairmanship of Mr. C. W. Lundy, director of welfare, Welfare Branch of the department.

Mr. R. Bowering, director of the Division of Public Health Engineering, has resumed his duties after a leave of absence of fifteen months. During that time he was working with the World Health Organization in Korea. Mr. Bowering was the only Canadian engineer selected for this work.

A New Health Unit with headquarters in Cloverdale is being formed in the Fraser Valley. This new unit will include school districts nos. 36 and 37 and the municipalities of Delta and Surrey. Dr. H. K. Kennedy, the director of this unit, was formerly director of the North Okanagan Health Unit.

Miss Yvonne Love, who has served as nutrition consultant with the Department of Health and Welfare since 1945, resigned in December to accept a teaching position in Vancouver. During her time with the department she has been a most enthusiastic and capable member of the Nutrition Service and has contributed a great deal to the nutrition education program in this province.

Alberta

Construction Grants totalling $154,000 for hospitals in Red Deer, Whitelaw, and Camrose have been approved by the Department of National Health and Welfare.

A grant of $67,000 has been given to the Red Deer Municipal Hospital where a new wing, which will more than double the hospital's bed capacity, is being built. The new section and alterations in the existing building will provide space for 57 beds, a 30-bassinet nursery, one minor and two major operating rooms, a complete x-ray suite, and new obstetrical services. The Red Deer hospital serves the 13 townships and the city of Red Deer in municipal hospital district 15.

The new hospital at Whitelaw, scheduled for completion next summer, will serve the entire Peace River district, with a population of 25,000. It will have 34 beds; x-ray, medical, and occupational therapy services; and facilities for minor surgery. This hospital is being built by the Religious Hospitallers of St. Joseph and has been named Hotel Dieu of St. Joseph.

A grant of more than $36,000 has been authorized for St. Mary's Hospital, Camrose. Work on this project was completed some time ago, but a claim for federal aid was not filed until recently. St. Mary's Hospital, operated by the Sisters of Charity, serves about 12,000 people in Camrose and district and is also a referral hospital for that area.

Saskatchewan

F. Burns Roth, M.D., director of hospital administration and standards for the past two years, was recently appointed deputy minister of public health. Dr. Roth is a native of Ontario and obtained his medical degree from the University of Western Ontario. He practised medicine for eleven years at Whitehorse, Yukon, during which time he served as medical health officer for the southern part of the Yukon Territory and also as superintendent of the Whitehorse General Hospital. Dr. Roth then took a course in hospital administration at the University of Toronto and, until his Saskatchewan appointment, was administrative resident at the Winnipeg General Hospital. He succeeds Frederick D. Mott, M.D., C.M., who has resigned to become medical administrator of the recently organized Memorial Hospital Associations of Virginia, West Virginia, and Kentucky, and to act as senior medical con-

sultant to the United Mine Workers of America Welfare and Retirement Fund. Dr. Mott was recently appointed a member of the Expert Advisory Panel on Social and Occupational Health of the World Health Organization.

MURRAY S. ACKER, M.D., D.P.H., returned recently to the Department of Public Health after completing a year's postgraduate study at the Usher Institute of Social Medicine in Edinburgh. Under the direction of Professor F. A. E. Crew, F.R.S., he was engaged largely in the study of medical and social statistics. During his stay at the Institute, he completed a special enquiry into the survivorship of cases of pulmonary tuberculosis in Edinburgh. On returning to Regina, Dr. Acker assumed the post of personal assistant to the deputy minister. He was formerly medical health officer for the Weyburn-Estevan Health Region.

G. W. PEACOCK, M.D., D.H.A., a native of Midland, Ontario, and for the past three years medical superintendent at the Kingston General Hospital, has been appointed director of hospital administration and standards to succeed Dr. Roth. Dr. Peacock obtained his M.D. at the University of Toronto. After graduation, he was in general practice in the Cobourg district in Ontario for fifteen years, during twelve of which he acted as part-time medical health officer. Dr. Peacock also holds a degree in hospital administration from the School of Hygiene, University of Toronto.

MR. HAROLD LOBB, B.A., M.Ed., teacher psychologist at Prince Albert for the past year and a half, has recently assumed the duties of assistant director of health education. Mr. Lobb was born in Saskatchewan and is a graduate of the University of Saskatchewan. After completing his M.Ed. degree, he took a year's course of mental health training at the University of Toronto. Mr. Lobb served for three years with the Royal Canadian Artillery and held the rank of captain at the time of his discharge. He succeeds Mr. Stanley Rands, M.A., who has become assistant director of the Psychiatric Services Branch.

DONALD MACRAE, M.B., Ch.B., M.D., director of venereal disease control for the past six months, has been placed in charge of the Moose Jaw Health Region as acting medical health officer.

Manitoba

THE HON. IVAN SCHULTZ, Minister of Health and Public Welfare, returned to Winnipeg in mid-January after a two-month tour of England, Scotland, Holland and Norway. On his return he presented his observations of medical-care plans in operation in those countries.

DR. E. C. CHAMBERLAYNE, for the past six years director of the Manitoba Bureau of Food Control, left in January for South America, where he will work on a project for the World Health Organization. This work is part of the technical service assistance offered by United Nations in fields of sanitation and communicable diseases common to man and animals. Dr. Chamberlayne will survey and assist in setting up veterinary public health administration in Bolivia, Peru, Venezuela, Ecuador, the Guianas, and the Netherlands Antilles. He has been granted a year's leave of absence from the Provincial Department of Health and Public Welfare. Before his departure, announcement was made that Dr. Chamberlayne had been elected a fellow of the American Public Health Association.

MISS LORAINE HOUCK, field health educator, has been posted to Dauphin Health Unit to act as a co-ordinator between school, community, and unit health education. Miss Houck joined the staff of the Manitoba Department of Health and Public Welfare in January.

METHAEMOGLOBINEMIA in young infants is being diagnosed in increasing numbers in Manitoba in the past few years, with causation directed to excessive nitrates in well-water used for formula or diet. Provincial health department authorities have taken steps to make the public aware of this well-water hazard in rural sections of the province. Press and radio publicity has been used to stress the importance of testing wells for nitrate before the water is used for young infants. Simple nitrate-testing kits have been prepared by the division of environmental sanitation for distribution to hospitals, local health units and a number of practising physicians. Accompanying the kit is a folder of information and findings on the condition of well-water blue babies, as well as a supply of nitrate test application forms and pamphlets for public lay use.

A REFRESHER COURSE for Licensed Practical Nurses is scheduled in Winnipeg for March 5, 12, and 19. The object of the course is to stress the need for specific nursing care of the patient with a heart condition. Lectures and demonstrations on improved nursing care, review of normal and abnormal anatomy, physiology of the adult and infant heart, types of heart conditions, special diets for heart patients, and rehabilitation of the heart patient will be included in the course.

A RESEARCH INVESTIGATION to determine cause and spread of staphylococcal infections of mothers and newborn infants was launched in Winnipeg late in January after a three-month study of case histories and statistics. Dr. Jean F. Webb, division of maternal and child hygiene, Department of National Health and Welfare, is survey director. She and her assistant, Miss Ruby Tinkiss, nursing consultant, work with a committee of physicians, hospital and provincial department of health officials. Dr. A. F. W. Peart, chief of the division of epidemiology, Department of National Health and Welfare, spent several days in Winnipeg to assist the investigation committee on a consultative basis. Dr. Peart said that similar studies were being carried out in Vancouver and Ottawa in an effort to solve the problems of cause, spread, prevention and control of this infection.

A SPECIAL SCREENING of mental health films "Breakdown" and "Angry Boy" was held for a selected audience by the Manitoba Department of Health and Public Welfare recently. Dr. M. R. Elliott, deputy minister of the department, acted as chairman of the program. Dr. T. A. Pincock, provincial psychiatrist, and Dr. J. L. Asselstine, director of Greater Winnipeg Child Guidance Clinic, elaborated the films for the audience. The films were introduced as instruments of mental health education for nurses, teachers, welfare workers, clergy, service organizations, community groups, and provincial health units.

DR. G. B. LEYTON, director of the provincial bacteriological laboratory, attended meetings of the laboratory section of the Canadian Public Health Association in Toronto recently. Prior to this, Dr. Leyton journeyed to Ottawa for meetings of the Technical Advisory Committee, Department of National Health and Welfare.

AS A FIRST STEP toward providing prepaid x-ray diagnostic services throughout Manitoba, the federal government is contributing more than $18,400 from its health grants for the purchase of x-ray equipment for the Virden health unit and for the Rossburn section of the Shoal Lake health unit. This service will enable residents of these districts to obtain x-ray diagnosis at cost in cases of illness or accident. Later, when the plan is fully operating, both x-ray and laboratory diagnostic services will be given without cost to the individual. X-ray equipment will be located in the new Virden District Hospital and in the medical nursing units at Reston and Elkhorn to serve the towns of Virden and Hartney, the village of Elkhorn, and the rural municipalities of Archie, Wallace, Woodworth, Pipestone, Sifton, Albert, Cameron and Miniota. They have a combined population of about 17,000. Plans are under way to set up an x-ray and laboratory service for the Shoal Lake district, with headquarters at Shoal Lake. In the meantime, x-ray equipment is being provided for the Rossburn medical nursing unit. It will continue as a branch of the main district office when this is organized later.

New Brunswick

THE VALLEE LOURDES SANATORIUM at Vallee Lourdes in northern New Brunswick has been allotted $85,000 from federal hospital construction grants to help extend its accommodation and $121,000 to assist in meeting the costs of caring for additional patients. The additional sanatorium beds in the north shore area will be of great assistance in the care of tuberculous persons who have not been able heretofore to get a bed in a sanatorium. The 86 additional beds for patients have been obtained by remodelling a building originally designed as a nurses' residence. The sanatorium, owned and operated by the Sisters of St. Joseph, serves mainly the people in northeastern New Brunswick but accepts patients from any part of the province.

Nova Scotia

THE ANNUAL STAFF MEETING of the Provincial Department of Health was held January 7-11, inclusive. The first day coincided with the course on clinical preventive medicine held by the post-graduate committee of the Dalhousie Medical School. This course

dealt mainly with maternal and infant hygiene and was completed in the evening by a very excellent paper on virus diseases by Dr. C. E. van Rooyen, of the Connaught Medical Research Laboratories and School of Hygiene, University of Toronto. There was a large attendance, including a number from the Province of New Brunswick.

THE FIRST PRIVATELY ENDOWED dental clinic for children in Canada was opened on September 26, 1951, at Shelburne. This clinic is known as the Dr. Gordon Robert MacKay Memorial Hospital for Shelburne County, Dental Clinic, and was made possible by the generous bequests of the late Doctor and Mrs. MacKay. Dr. MacKay was a native son of Shelburne County who spent most of his active life practising dentistry in Boston, Massachusetts. His fondness for his native county was shared by his wife. For many years the MacKays spent their summers in Shelburne, and this dental clinic is the culmination of their carefully conceived plan to found a lasting memorial that would benefit the children of Shelburne County. A local Board of Trustees administer this memorial dental clinic. They have at their disposal the spacious MacKay residence on King Street, in Shelburne, also the annual income from the MacKay estate. To supplement the annual income, which is insufficient for the full-time operation of this dental clinic, the following plan of operation has been adopted.

One wing of the MacKay residence has been converted into a dental office. This office has two operating rooms, dark room, laboratory, business office, wash room and reception room, and is completely equipped with modern dental equipment and has a separate entrance. The combined residence and dental office has been rented to a resident dentist. This dentist is employed on an hourly basis to operate the Memorial Dental Clinic for three hours each school day morning. The clinic is intended to provide as much dental care as possible for the children of Shelburne County not at the present time receiving regular dental attention.

For the first year of operation, the children in the pre-school group and Grades I and II will be eligible for free dental care. It is proposed to extend the age group in the second year of operation to include those in Grade III who attended the dental clinic the preceding year.

This progressive enlargement of the clinic scope will continue until the capacity of the clinic is reached. Each community is expected to provide transportation for the children to and from the dental clinic. They also are expected to send an adult who will be in charge of the group of children from their community.

To date, over 80 per cent of the school districts in Shelburne County have signified their desire to participate in this plan.

Prince Edward Island

PRINCE EDWARD ISLAND is developing an organized nutrition program as part of its provincial public health service, with the support of a federal health grant. The new service, which is being directed by Miss Hazel Roland, is developing an informational program about good nutrition with the co-operation of community leaders and interested organizations. The need for a nutrition program is emphasized by a recent survey conducted in a large number of rural schools which revealed that many children are not receiving nutritionally adequate meals as outlined in "Canada's Food Rules."

As the nutrition program develops, provincial health authorities hope to carry out more studies of food habits and the nutritive value of common foods grown on the Island. With the assistance of the Department of Agriculture, it is hoped to stimulate the production of nutritive foods for home use. Improvement in the nutritive values of food will also be sought through better handling of it in stores, in public eating places and in the home, and by better storage facilities and more economical buying.

The nutrition division is expected to be of considerable help in solving nutritional problems encountered by many small institutions without a staff dietitian.

The division will develop a program for the population at large and will reinforce the work being done for special groups by the home economists of the Department of Agriculture, the dietitians in the larger hospitals who instruct student nurses, and the supervisor of household economics at Prince of Wales College who gives a course in nutrition to teachers in training.